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STAFFING RATIOS IN SCHOOLS

by



DAVID MACLEOD GREGORY

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "Staffing Ratios in Schools," submitted by David MacLeod Gregory in partial fulfilment of the requirements for the degree of Master of Education.

ABSTRACT

This study described the relationships between the size of schools and (1) the relative size of in-school administrative and support staff, and (2) the salary cost of in-school administrative and support staff of the four school districts in Edmonton and Calgary. This study also compared in-school administrative and support staff ratios and costs of schools grouped according to size and grade level. The final part of the study dealt with the opinions of the principals as to the adequacy of time allotted to administrative, supervisory and support personnel.

Data were collected by means of questionnaires sent to all principals and by requests for information from central office files. Usable replies were obtained from 407 of 429 schools.

Significant negative Pearson product moment correlation coefficients ($p < 0.05$) were obtained between (1) the number of administrative personnel per 1000 pupils and number of pupils, and (2) the percentage of total paid staff time spent on administrative positions and total paid staff, at the elementary-junior high and senior high school grade levels. The correlation coefficients between (1) the cost per pupil of administrative personnel and number of pupils, and (2) the cost per paid staff member of administrative personnel and total paid staff, also showed significant negative relationships at the elementary, junior high and senior high school grade levels.

Pearson product moment correlation coefficients between (1) the number of support personnel per 1000 pupils and number of pupils, and

(2) the percentage of total paid staff time spent on support positions and total paid staff, showed significant negative relationships only at the senior high school grade level. The correlation coefficients between (1) the cost per pupil of support personnel and number of pupils and (2) the cost per paid staff member of support personnel and total paid staff showed significant negative relationships at the junior high and senior high grade level.

The results of the opiniaonaire to principals on the adequacy of the time allotted to various administrative and support positions indicated that (1) the majority of junior-senior high and senior high school principals felt they had sufficient time to complete administrative tasks, (2) the majority of principals in all grade levels felt they did not have enough time for staff supervision, and (3) the amount of time allotted to the support component was generally insufficient at all grade levels.

The results of the opiniaonaire for three categories of the support component are given as follows: (1) guidance - the majority of elementary-junior high school principals felt that they had sufficient time allotted, (2) library - the majority of elementary-junior high, junior high and junior-senior high school principals felt that they had sufficient time allotted, and (3) audio-visual - the majority of principals using these personnel, in all grade levels, felt that these personnel had not been allotted sufficient time.

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CHAPTER 1

THE PROBLEM AND DEFINITION OF TERMS

INTRODUCTION

Terrien and Mills (1955:13) conducted a study in various California School Districts which indicated that a direct relationship existed between the growth of the administrative component and the growth of the whole school district. A popular publication by Parkinson (1957) supported this finding and stated strongly that the administrative portion of any organization continues to expand regardless of the organization's total growth pattern. Over-bureaucratization has been assumed to be a contributing factor: as Blau and Scott (1962:226) state:

It is widely assumed that large organizations tend to be over-bureaucratized, that is, that an increase in organizational size is accompanied by a disproportionate increase in administrative overhead.

However, research findings seem to show otherwise. A number of such studies have been completed at The University of Alberta during the latter part of the 1960's, at the school district level. For example, Vithayathil (1969:100) concluded that "... administrative ratios in school systems decreased as system size increased." These studies attempted to answer questions about the nature and characteristics of the growth of the administrative component of an organization as organizational size increases.

Recent research indicated generally that as organizations grow they need an increasingly elaborate administrative structure. Campbell,

Corbally and Remseyer (1968:85) identify the increased number of tasks of central office personnel which accompany such organizational growth.

The trend in education has been towards larger schools in terms of students and staff. Interesting questions concerning staffing ratios begin to arise when these schools are considered as part of the larger organization of the school district. Do the relationships between the administrative components, support components and measures of school size bear the same characteristics as the relationships found within a school district as a unit? Blau (1970:205) states that characteristics of a branch or agency (in this case a school) will be the same as those for the total organization of which it is a part.

The trend toward increasing the size and complexity of the administrative structure has developed opposing views as to its efficiency. Indik (1965:7) feels that as groups grow larger, inter-group relationships multiply and the complexity of tasks increases; therefore, increased supervision becomes necessary. The rapid growth in subject knowledge requires, to a larger extent, more specialists. The trends toward increased supervision and specialization makes the educational organization more complex. Parkinson (1957:15-22), Terrien and Mills (1955:13) and Tsouderos (1955:208) concluded from their research, into the British Navy, California School Districts and ten voluntary agencies respectively, that as the size of an organization increases it is accompanied by an increase in the proportion of personnel in administrative positions.

Other researchers disagree with these findings. Gill (1967:103), Blowers (1969:156), Vithayathil (1969:106), Lepatski (1970:126) and Duboyce (1970:94) all concluded from studies of Western Canadian school

systems that an increase in size resulted in a decline in the proportion of personnel in the administrative component. Litterer (1965:409) states that growth in an organization is accompanied by changes in the administrative component which result in increased over-all organizational efficiency, and therefore, to a decrease in the administrative component.

Few studies have been completed on the support staff component in education. The Canadian Education Association (1964) completed a study in Canada of 79 urban boards, of which 58 were finally used, which concluded that size had little association with clerical assistance ratios. Lepatski (1970:125) found high positive correlations between the percentage of total staff in support positions and each measure of size for twenty-one metropolitan school systems in Western Canada.

The above studies on administrative and support components in education were all completed at the school system level. These results on administrative and support staff ratios and salaries led to unanswered questions about their applicability in regards to individual schools of different sizes.

THE PROBLEM

Statement of the Problem

This study describes the relationships between the size of schools and (1) the size of in-school administrative and support staff; and (2) the cost of in-school administrative and support staff of the four public and separate school districts in Edmonton and Calgary. This

study also compares in-school administrative and support staff ratios and costs for schools grouped according to size and grade level. The final part of the study relates opinions of the principals to the adequacy of time allotted to administrative and supervisory and support personnel.

Sub-problems. The major problems were separated into a number of sub-problems.

Sub-problems Relating to Number of Staff per 1,000 Pupils

(1) What relationship exists between the number of personnel per 1,000 pupils in administrative positions and the total number of pupils in schools grouped according to grade level?

(2) What relationship exists between the number of personnel per 1,000 pupils in administrative positions and the total number of pupils in schools grouped according to various size measures?

(3) What relationship exists between the number of personnel per 1,000 pupils in support positions and the total number of pupils in schools grouped according to grade level?

(4) What relationship exists between the number of personnel per 1,000 pupils in support positions and the total number of pupils in schools grouped according to various size measures?

(5) What relationship exists between the number of personnel per 1,000 pupils in non-instructional positions and the total number of pupils in schools grouped according to grade level?

(6) What relationship exists between the number of personnel per 1,000 pupils in non-instructional positions and the total number

of pupils in schools of various size measures?

Sub-problems Relating to Per Pupil Staff Cost

(7) What relationship exists between the cost per pupil of administrative personnel and the total number of pupils in schools grouped according to grade level?

(8) What relationship exists between the cost per pupil of administrative personnel and the total number of pupils in schools grouped according to various size measures?

(9) What relationship exists between the cost per pupil of support personnel and the total number of pupils in schools grouped according to grade level?

(10) What relationship exists between the cost per pupil of support personnel and the total number of pupils in schools grouped according to various size measures?

(11) What relationship exists between the cost per pupil of non-instructional personnel and the total number of pupils in schools grouped according to grade level?

(12) What relationship exists between the cost per pupil of non-instructional personnel and the total number of pupils in schools grouped according to various size measures?

Sub-problems Relating to Percentage Distributions of Staff

(13) What relationship exists between the percentage of total paid staff time spent in administrative positions and the total paid staff in schools grouped according to grade levels?

(14) What relationship exists between the percentage of total paid

staff time spent in administrative positions and the total paid staff in schools grouped according to various size measures?

(15) What relationship exists between the percentage of total paid staff time spent in support positions and the total paid staff in schools grouped according to grade levels?

(16) What relationship exists between the percentage of total paid staff time spent in support positions and the total paid staff in schools grouped according to various size measures?

(17) What relationship exists between the percentage of total paid staff time spent in non-instructional positions and the total paid staff in schools grouped according to grade levels?

(18) What relationship exists between the percentage of total paid staff time spent in non-instructional positions and the total paid staff in schools grouped according to various size measures?

Sub-problems Relating to Proportional Costs of Staff Components

(19) What relationship exists between the cost per paid staff member of administrative personnel and the total paid staff in schools grouped according to grade level?

(20) What relationship exists between the cost per paid staff member of administrative personnel and the total paid staff in schools grouped according to various size measures?

(21) What relationship exists between the cost per paid staff member of support personnel and the total paid staff in schools grouped according to grade level?

(22) What relationship exists between the cost per paid staff member of support personnel and the total paid staff in schools grouped

according to various size measures?

(23) What relationship exists between the cost per paid staff member of non-instructional personnel and the total paid staff in schools grouped according to grade level?

(24) What relationship exists between the cost per paid staff member of non-instructional personnel and the total paid staff in schools grouped according to various size measures?

Sub-problems Relating to Adequacy of Staffing Ratios

(25) To what extent do principals feel that their present administrative and supervision ratios are adequate?

(26) To what extent do principals feel that their present support personnel ratio is adequate?

Justification of the Study

Research in the area of administrative and support staff proportion has to date been at the school system level [e.g. Gill (1967), Blowers (1969), Vithayathil (1969) and Lepatski (1970)]. These studies were all completed at The University of Alberta as part of an overall integrated study. Projection to the individual school level appears to be a logical and useful extension of the prior research. Some data is available on the numbers of administrators in schools, but analysis involving the proration and proportional aspects has not yet been attempted in detail.

Holdaway (1971:1) states that there are certain areas where information is lacking which could be useful in the decision-making process. These are: "(1) numbers and salaries of instructional staff,

(2) numbers and salaries of various categories of non-instructional staff, (3) capital costs, (4) equipment and supplies, (5) other costs of operation." This information is necessary if school boards and central office administrative staff are to make rational and functional decisions. The analysis concerning in-school administrative ratios and support staff ratios relating to numbers of pupils could provide information concerning optimal school size (at different grade levels) in the sense of minimal overhead staffing needed for efficient school operation and also for efficient operation in terms of cost.

House and Miner (1969:461) cite another factor to consider when analyzing administrative and support staff ratios: "Research in group dynamics has revealed a negative correlation between group size and group cohesion, consensus, the extent of participation, and member satisfaction." Small groups are more effective with those tasks which require interaction among its members. As groups increase in size the leader has more difficulty in maintaining coordination and control. In terms of group productivity or effectiveness, the results of the analysis on administrative and support staff ratios would prove valuable. The span of control could be altered to ensure a desirable level of productivity or effectiveness as defined by a particular school board.

DEFINITION OF TERMS

Lane, Corwin and Monahan (1967:6) state that "administration in any organization is composed of a number of rational functions." Sears (1950:30), Griffiths (1962:154), and Campbell et al. (1966:96) agree with Lane, Corwin and Monahan in identifying the major functions as

planning, organizing, directing, coordinating and controlling. Individuals, then, who perform any of the above functions can be classified as administrators.

Campbell et al. (1966:96,133) state that the administrative component of a school district should include those concerned with business, building, and various maintenance departments. They see administrative tasks as including the following areas: school-community relations, curriculum development, staff personnel, pupil personnel, physical facilities, finance and business management, and organization and structure.

From a review of the literature, Lepatski (1970:11-12) included in the administrative component all personnel who: (1) plan, organize, direct, coordinate, and/or control the activities and personnel of the school system; (2) make key organizational decisions; (3) supervise the work of other personnel; and (4) do not work directly with students or their instruction.

In-school administrative staff (Administrative Component).

Lepatski (1970:13) developed a definition for in-school administrative staff from his definition of the administrative component. This definition differed from previous ones used by Gill and Blowers as their in-school administrative staff consisted of principals only. Lepatski's (1970:13) definition included all principals, assistant principals, head teachers, department heads, assistant department heads, subject coordinators and business managers on a prorated basis. The in-school positions in Lepatski's study were prorated on the basis of central office estimates while in-school positions in this study were

prorated on the basis of the principal's estimates.

In-school support staff (Support Component). Lepatski (1970:13) included support staff both from central office and from the schools. He defined school support staff as secretarial and clerical personnel, custodians and teacher aides.

For the purpose of this study only those support personnel located in schools were included and were defined as follows - those non-teaching persons, attached to individual schools, who are associated with programs designed to supplement the classroom teacher or administrator. "Support personnel" therefore included guidance personnel, library offices, audio-visual personnel, paid aides, voluntary aides, laboratory assistants and clerical staff, and excluded plant personnel, food service personnel, transportation personnel and health officers.

In-school non-instructional staff (Non-Instructional Component). Yeager (1959:6) states, "Non-instructional personnel are those personnel whose services are auxiliary to the instructional process but not directly related to it." As in Lepatski's study (1970:14) this definition was accepted, meaning that all in-school administrative and support personnel were embodied in the term in-school non-instructional staff.

In-school instructional staff (Instructional Component). The instructional component refers to all teachers involved in classroom instruction. It also includes the portion of time spent by an in-school administrator or support personnel in classroom teaching. Thus, if an administrator used 70 per cent of his time in administrative duties and

30 percent of his time in classroom instruction, then 0.7 full-time equivalents were charged to in-school administration and 0.3 full-time equivalents to the instructional component. This same procedure applied to the time of in-school support personnel.

In-school administrative cost (Cost of Administrative Staff).

The total gross salaries paid to in-school administrative staff, including administrative allowances, constituted, on a prorated basis, the in-school administrative cost.

In-school support cost (Cost of Support Staff). The total gross prorated salaries paid to in-school support staff constituted the in-school support cost.

In-school non-instructional cost (Cost of Non-instructional Staff). The total prorated gross salaries paid to all non-instructional personnel formed the non-instructional cost.

In-school instructional cost (Cost of Instructional Staff). The total prorated gross salaries paid to all instructional personnel constituted the in-school instructional cost.

Size of the school. Two separate measures of school size were used: (1) total number of paid staff in the school; and (2) total number of pupils in the school.

Ratios of in-school administrative, support and non-instructional time. Each of these ratios were expressed as:

$$\frac{\text{Total time spent by all individuals in that category}}{\text{Size of the school system}}$$

Cost ratios of in-school administrative, support and non-instructional time. These ratios were expressed as:

$$\frac{\text{Total cost of time spent by all individuals in that category}}{\text{Size of the school}}$$

ORGANIZATION OF THE THESIS

This chapter has presented a statement of the problem, its sub-problems, and definitions of terms used in the study.

Chapter 2 includes a review of the literature related to the growth of the administrative and support components of educational organizations.

Chapter 3 describes the sample, the various research procedures, data collection, methods and the statistical processes used in analyzing the data.

Chapter 4 presents the mean data for the administrative, support and non-instructional components for the various groupings. Analysis of the data for the degree of association between the three components and two measures of size are included.

The opinions of the principals as to the adequacy of time allotted to administrative, supervisory, guidance, library, audio-visual, teacher aides (paid), teacher aides (voluntary), laboratory assistants and clerical personnel are given in Chapter 5.

Chapter 6 contains the summary, implications and recommendations for further study.

CHAPTER 2

REVIEW OF THE LITERATURE

Organizational growth produces problems which school systems and individual schools will have to face to an increasing extent in the future. There are two approaches to studying this problem. The first, how it affects the individual student, is discussed by Campbell (1965:3):

... implications are that while students in large schools were exposed to a larger number of school activities and the best of them achieved standards in many activities that were unequalled by students in small schools, students in small schools participated in more activities, their versatility and performance scores were consistently higher, they reported more and better satisfactions and displayed stronger motivation in all areas of school activity (Campbell, 1965:3).

The second approach concerns how it affects the internal structure of the school. In this approach an attempt must be made to determine the relationships of school size to (a) the size of administrative, supervisory and support personnel components, and (b) the cost of administrative, supervisory and support personnel components.

This particular study was concerned with the second approach.

Administrative Ratio

Rushing (1968:274-75) documents twelve studies in this area of relationships between organizational size and administrative personnel. He concludes that two studies show an increased relative number of administrative personnel with larger organizational size, six show a decrease, and four show no change at all.

Three cross-sectional empirical studies completed by Gill (1967), Vithayathil (1969) and Lepatski (1970) at The University of Alberta support the contention that there is a negative relationship between

the administrative ratio and the size of an organization. These studies were all undertaken at the school system level.

Blowers (1969) in a longitudinal study of forty-one school systems in Western Canada also came to the conclusion that the administrative ratio in a school system decreases as the size of the school system increases. In another longitudinal study, Duboyce (1970) demonstrated that the numbers of the central office administrative staff to the total central office staff of one large school district have become proportionally smaller over the past twenty-five years.

Other studies of a speculative and empirical nature have been thoroughly documented in Masters' theses completed by Gill, Vithayathil, Lepatski, Blowers and Duboyce, and do not require repetition (see Table 1).

The above five Masters' theses were all done at school system level and as such apply only to those areas. One can only speculate as to whether or not those results would apply to the individual school: however, Blau (1970:205) indicates that those school district results would probably apply to individual schools when he states:

The internal differentiation within the subunits that have become differentiated in the agencies assumes the same form. The larger a local branch, the greater the differentiation into occupational positions ($r=.51$), hierarchical levels (.68) and functional sections (.61). This differentiation occurs at declining rates with increasing size....

Support Personnel Ratio

As schools increase in size, the size of the support component is also affected. Haire (1959:297) has stated "The total number of clerical workers does increase as the company increases In

TABLE 1

Comparison of Mean Percentages of Staff in Administrative Positions in Groups of California School Systems, and Western Canadian School Systems of Different Sizes^a

Researcher	Group	Number in Group	No. of Prof. Employees	Admin. Component-Mean Percentage	Std. Dev.
Terrien and Mills ^b	small	31	13- 249	13.7	3.7
	medium	27	250- 999	14.3	2.5
	large	10	1000-4620	15.6	1.7
Gill ^c	small	18	47- 248	10.7	2.3
	medium	12	252- 761	8.6	1.2
	large	7	1026-3099	6.7	1.3
Blowers ^d	small	16	56- 185	9.61	2.49
	medium	13	267- 616	8.57	2.33
	large	12	904-3700	6.88	1.55

^aThis table is taken from Duboyce (1970:23).

^bObtained from Terrien and Mills (1955:13).

^cObtained from Gill (1967:46).

^dObtained from Blowers (1969:69).

general as the companies went from 40 to 80 employees the clerical staff doubled." He reasons further that the growth of the number of clericals is not related to size but is related to time. The older a company becomes the greater the tendency for a larger number of clerks to appear.

The Canadian Education Association (1964:5) initiated a study of 79 urban school boards in Canada to determine the relationship between school system size and amount of clerical assistance provided. They arrived at the conclusion that school system size had little association with clerical assistance ratios.

Lepatski (1970:125) in his study on staffing ratios and costs in twenty-one school systems in Western Canada found significant positive correlations between the percentage of total staff in support positions and each measure of their system size (see Table 2).

Duboyce's (1970:95-96) study was also concerned with auxiliary and support staff. He divided the auxiliary staff into two categories: those concerned primarily with teachers and those compared primarily with pupils. Both categories showed comparative increases to all measures of district size over the past twenty-five years.

The central office support staff consisting of those who execute clerical, secretarial or custodial functions has, over the past twenty-five years, increased in relation to all measures of district size.

In contrast to the above arguments Blau (1970:209) states "the proportional size of any supportive service provided by a distinctive minority to the majority work force is likely to decline with increasing organizational size."

TABLE 2

Mean Numbers of Staff for Various Components in
Groups of School Systems^a

Group	No. of School Systems in the Group	Size Range of Group (number of pupils)	Support	Non- instructional
<u>Mean Number of Staff per 100 Staff (percentage of total staff):</u>				
1	8	3,034- 7,016	19.84	28.45
2	5	8,173-15,853	21.16	29.27
3	6	19,208-32,470	22.00	29.57
4	2	48,106-75,007	27.54	35.35
<u>Mean Number of Staff per School:</u>				
1	8	3,034- 7,016	4.86	6.97
2	5	8,173-15,853	5.59	7.82
3	6	19,208-32,470	6.16	8.20
4	2	48,106-75,007	10.66	13.68
<u>Mean Number of Staff per 1,000 Pupils:</u>				
1	8	3,034- 7,016	11.43	16.40
2	5	8,173-15,853	12.02	16.80
3	6	19,208-32,470	12.34	16.42
4	2	48,106-75,007	16.71	21.45

^aThis table is taken from a study done by Lepatski (1970:68).

Administrative Cost

Lepatski (1970) completed a study on the metropolitan school systems of Winnipeg and Vancouver in regards to size and administrative costs. By using mean administrative costs per pupil he was able to indicate clearly a "tendency for lower costs to be associated with groups containing large systems than for groups containing small systems" (Lepatski, 1970:127).

A study by Small (1967) split administrative services into two categories: (a) mandatory -- costs of the principal and vice-principal, and (b) discretionary -- cost of resident professional administrators other than principals and vice-principals. The results were as follows -- when schools were classified by type (elementary, elementary-junior high, junior high and senior high) mandatory costs varied little; discretionary costs increased in the order elementary, elementary-junior high, junior high and senior high. When categorizing schools by size, the average per pupil discretionary cost increased with size. When schools were categorized by both size and type, mandatory and discretionary costs increased in the order elementary, elementary-junior high and junior high in each size range. Since a different size classification was used for senior high schools the size-type-cost analysis was not included for these schools.

Where there is no tangible return to the education industry, a problem arises in relating cost to school size. Cost could be applied to schools much the same manner as the Law of Diminishing Returns (Samuelson, 1966:24) is used in industry, only in this case it could be called the Law of Diminishing Costs. Blau (1970:210) states that:

...if the proportion of managerial personnel declines with size and their span of control expands with size this means that large scale operations reduce the proportionate size of administrative overhead, specifically, of managers and supervisors -- other administrative overhead such as staff and support personnel also declines.

Large scale operations make it possible to achieve economies with administrative personnel up to an optimum size. However, once this optimum size has been passed, these economies of scale decrease with increasing organizational size, until after a certain point they no longer exist with the result being diseconomies of scale.

Costs of Support Personnel

The above rate of diminishing costs would also hold true for support personnel if Blau's proposition, that the proportionate size of support personnel decreases with increase in organizational size, holds true. However, if study supports Lepatski's findings of a proportionate increase in support personnel with increase in size of organization, then the proportionate cost of support personnel will also increase.

Summary of Chapter 2

The overwhelming majority of evidence indicates that there is a negative relationship between administrative ratio and size of an organization. Rushing (1968) documents only two studies where the opposite holds true, and later empirical studies done by Gill, Blowers, Vithayathil and Lepatski support the hypothesis of a negative relationship.

The results of studies done on support personnel do not agree as to whether or not there is any relationship between support personnel ratios and size of organization.

CHAPTER 3

DESCRIPTION OF THE SAMPLE AND RESEARCH PROCEDURES

The population proposed for the study consisted of every one of the 429 schools in the Edmonton and Calgary Public and Separate School Districts. Of the 429 questionnaires sent, 412 or 96.5 percent were returned. Four of the returned questionnaires were not used due to omissions in the information requested, and also, due to the fact that there was only one school in the Elementary-Junior-Senior High School category it was omitted. This left 407 schools or 95.1 percent of the population. The return is so high that this is not really a sample but more of a population. It could be used as a sample if generalizations are to be made to other large urban centres in Alberta other than Edmonton and Calgary.

Assumptions

The validity of the study is dependent upon the accuracy and completeness of data provided by individual schools in the sample. Two assumptions were necessary: (1) that the information required was clearly understood by those individuals who were to supply it, and (2) that the information required was perceived in the same manner by those who were supplying the information and those who requested it.

Limitations

The study was cross-sectional, and as such did not provide growth patterns but rather a description of a situation at a given time.

The study also did not account for any differences in administrative, support, non-instructional or instructional components by any other measures than grade level or size groupings. This, for example, did not allow for differences in any of the components due to the fact that some are classified as inner-city schools and others are not.

Collection of Data

Information was obtained from the following two sources.

(1) A questionnaire (see Appendix 1) was sent to the principals of all schools in the sample requesting the following information:

- (a) names of administrative personnel
- (b) average percentage of time each week spent on
 - (i) administration and staff supervision
 - (ii) teaching
 - (iii) preparation
- (c) names of support personnel
- (d) average percentage of time spent on
 - (i) the support position
 - (ii) teaching
 - (iii) preparation
- (e) opinion of principals concerning the amount of
 - (i) administrative and supervisory time allotted
 - (ii) the amount of time allotted for each in-school support position.

(2) Central office records:

- (a) Average salary for each in-school administrative and support personnel position.

Questionnaires to principals in the Edmonton Public School District and the Calgary Separate School District were sent directly to them by mail and were returned individually by the principals in the mail.

Questionnaires were sent in a group to the central office of the Edmonton Separate and Calgary Public systems for distribution to the individual principals. Principals in the Edmonton Separate system returned the questionnaires individually by mail, while principals in the Calgary Public system returned their questionnaires to the central office from where they were returned by mail.

The information requested from the central offices was compiled by their personnel. In the case of the Calgary Separate system the information was returned by mail, while in the other three systems the information was collected personally.

Analysis of Data

The sizes of the administrative and support components and sizes per school were calculated according to the definitions in Chapter 1. Using these variables the various ratios were computed.

The population was separated into subgroups according to grade levels and various size groupings within the grade levels. The means were then calculated for the administrative, support and non-instructional ratios for each group.

The mean cost ratios were developed in the same manner.

The degree of association between the following variables were

computed by means of the Pearson Product Moment Correlation Coefficient:

- (1) administrative ratios and school size by grade level
- (2) support personnel ratios and school size by grade levels
- (3) administrative cost ratios and school size by grade level
- (4) support cost ratios and school size by grade level.

The reasons for using the Pearson Correlation Coefficients are as follows:

The product-moment coefficient, r_{xy} , is a sensitive measure of the association or relationship between two variables. Since it is independent of the unit of measurement and of the number in the sample, it is an abstract measure . . .

Just what r_{xy} means and just how it is interpreted are best seen in connection with its uses. These include . . .

2. The analysis of relationships between two or more variables . . .

6. The estimation of the coefficient of correlation in the population . . . (Tate, 1965:140).

The answers given by principals to the opinionnaire relating to the adequacy of time allotted to administrative supervisory, guidance, library, audio-visual, teacher aides (voluntary), teacher aides (paid), laboratory assistants and clerical personnel were developed into simple frequency counts and percentages. This was done for each grade level and grouping within grade levels.

Summary of Chapter 3

The population for the study consisted of all 429 schools in the Public and Separate School Districts of Edmonton and Calgary. Usable replies were obtained from 407 schools, which constituted the sample. Data were collected from school principals and central office records.

The sample was separated into groups by grade levels and various size groupings within the grade levels. Analysis of the data

found in each grouping involved comparisons of means and use of the Pearson Product Moment Correlation Coefficients.

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

The data and analysis related to the problems and subproblems are presented in this chapter. Because a very considerable amount of data was collected, only means of the components being investigated for various groupings are presented.

PRESENTATION OF THE DATA

Table 3 presents the mean numbers, in full-time equivalents, of in-school administrative, support and non-instructional personnel according to (1) grade level, and (2) two measures of size, the number of pupils and number of total paid staff, within the grade levels.

The schools were grouped by grade levels according to the following five classifications: (1) elementary, (2) elementary-junior high, (3) junior high, (4) junior-senior high, and (5) senior high. The size groupings by number of pupils and total paid staff varied within each grade level. The tables also present the total number of schools found within each grouping. The 407 schools presented in the groupings are ordered on the basis of increasing size.

Table 4 shows the mean salary cost of in-school administrative, support and non-instructional personnel grouped by grade level and size as mentioned in the previous paragraph.

The administrative, support and non-instructional components, and salary costs of the various components, are as defined in Chapter 1.

TABLE 3

MEAN NUMBER (F.T.E.)* OF IN-SCHOOL ADMINISTRATIVE, SUPPORT AND
NON-INSTRUCTIONAL PERSONNEL

School Groupings	Total Number of Schools	Mean Admin. Staff	Mean Support Staff	Mean Non-Instructional Staff
<u>Elementary</u>	241	.91	2.52	3.43
<u>NOP**</u>				
8- 250	79	.54	1.78	2.32
251- 500	122	.97	2.57	3.54
501+	40	1.44	3.84	5.28
<u>TPS***</u>				
1.0- 7.0	24	.30	.79	1.09
7.1-14.0	71	.69	1.80	2.49
14.1+	146	1.11	3.16	4.27
<u>Elementary-Junior High</u>	82	2.03	3.86	5.89
<u>NOP</u>				
215- 400	22	1.00	3.05	4.05
401- 600	32	2.94	3.55	6.49
601- 800	24	1.90	4.59	6.35
801+	4	2.00	6.38	8.38
<u>TPS</u>				
10.6-20.0	20	.92	2.45	3.37
20.1-30.0	29	1.47	3.60	5.07
30.1+	33	3.18	4.94	8.12
<u>Junior High</u>	44	1.76	4.82	6.58
<u>NOP</u>				
267- 400	10	1.15	3.06	4.21
401- 600	15	1.69	4.67	6.36
601- 800	15	2.15	5.38	7.53
801+	4	2.13	7.65	9.78
<u>TPS</u>				
15.0	1	.84	2.10	2.94
15.1-30.0	18	1.33	3.76	5.09
30.1-45.0	22	2.02	5.31	7.33
45.1+	3	2.74	8.46	11.20
<u>Junior-Senior High</u>	7	4.43	8.29	12.70
<u>Senior High</u>	32	5.82	12.02	17.84
<u>NOP</u>				
90- 800	6	3.41	6.26	9.67
801-1600	19	5.83	11.32	17.15
1601+	7	7.88	18.86	26.72
<u>TPS</u>				
10.0- 50.0	7	3.66	7.15	10.81
50.1-100.0	20	5.56	11.37	16.93
100.1+	5	9.83	21.47	31.30

* - Full Time Equivalent ** - Number of Pupils *** - Total Paid Staff

TABLE 4

MEAN COST OF IN-SCHOOL ADMINISTRATIVE, SUPPORT AND
NON-INSTRUCTIONAL PERSONNEL

School Groupings	Total Number of Schools	Mean Admin. Staff Cost	Mean Support Staff Cost	Mean Non-Instructional Staff Cost
<u>Elementary</u>	241	\$ 13,977	\$ 11,843	\$ 25,821
<u>NOP</u>				
8-250	79	8,510	6,245	14,755
251-500	122	15,017	12,504	27,521
501+	40	21,603	20,885	42,488
<u>TPS</u>				
1.0- 7.0	24	4,769	2,558	7,328
7.1-14.0	71	10,924	6,768	17,693
14.1+	146	16,975	15,837	32,813
<u>Elementary-Junior High</u>	82	24,672	23,038	47,710
<u>NOP</u>				
215-400	22	15,264	16,434	31,699
401-600	32	29,303	23,144	52,447
601-800	24	26,335	26,508	52,844
801+	4	29,382	37,685	67,067
<u>TPS</u>				
10.6-20.0	20	14,402	13,656	28,058
20.1-30.0	29	21,015	22,193	43,209
30.1+	33	34,109	29,466	63,576
<u>Junior High</u>	44	25,097	31,518	56,616
<u>NOP</u>				
267-400	10	17,291	20,616	37,907
401-600	15	24,693	30,588	55,281
601-800	15	28,630	36,006	64,636
801+	4	32,885	45,428	78,313
<u>TPS</u>				
15.0	1	12,794	15,600	28,394
15.1-30.0	18	19,873	25,416	45,290
30.1-45.0	22	28,735	34,785	63,521
45.1+	3	33,867	49,475	83,343
<u>Junior-Senior High</u> 7		53,975	55,088	109,063
<u>Senior High</u>	32	78,954	80,168	159,122
<u>NOP</u>				
90- 800	6	38,458	44,437	82,896
801-1600	19	81,320	75,811	157,132
1601+	7	107,243	122,620	229,863
<u>TPS</u>				
10.0- 50.0	7	44,564	48,318	92,882
50.1-100.0	20	77,105	77,442	154,547
100.1+	5	134,496	135,663	270,159

Table 5 presents the mean ratios, based upon number of pupils, for the administrative, support and non-instructional components for groupings according to grade level and size within grade levels. For convenience in comparison, the ratios based upon pupil size were multiplied by 1000. Thus comparisons of the various components in Table 5 have been made on a per 1000 pupils basis.

Table 6 contains the mean percentages of total paid staff time occupied in administrative, support and non-instructional functions for groupings according to grade level and size groupings within grade levels.

Table 7 indicates the mean cost per pupil of administrative, support and non-instructional personnel for groupings according to grade level and size within grade levels.

Table 8 presents the mean cost per paid staff member of administrative, support and non-instructional personnel for groupings according to grade level and size within grade levels.

STATISTICAL ANALYSIS OF THE DATA

Correlations

The associations between the administrative, support and non-instructional component ratios and the two measures of size (number of pupils and total paid staff), were computed using the Pearson Product Moment Correlation Coefficients and tested for significance. The correlation coefficients and tests for significance were completed for all groups, for all schools in each grade level taken collectively, and for schools in each size grouping within the grade level.

TABLE 5

MEAN NUMBERS (F.T.E.) OF IN-SCHOOL ADMINISTRATIVE, SUPPORT
AND NON-INSTRUCTIONAL PERSONNEL PER 1000 PUPILS

School Groupings	Total Number of Schools	Mean Admin. Staff /1000 Pupils	Mean Support Staff /1000 Pupils	Mean Non-Instructional Staff/1000 Pupils
<u>Elementary</u>	241	2.93	8.56	11.49
<u>NOP</u>				
8-250	79	3.50	11.89	15.39
251-500	122	2.76	7.18	9.94
501+	40	2.33	6.17	8.50
<u>TPS</u>				
1.0- 7.0	24	3.20	11.07	14.27
7.1-14.0	71	3.40	9.37	12.77
14.1+	146	2.66	7.75	10.41
<u>Elementary-Junior High</u>	82	3.96	7.57	11.53
<u>NOP</u>				
215-400	22	3.03	9.21	12.24
401-600	32	5.83	7.12	12.95
601-800	24	2.62	6.74	9.34
801+	4	2.15	7.19	9.45
<u>TPS</u>				
10.6-20.0	20	2.79	7.39	10.18
20.1-30.0	29	2.96	7.46	10.44
30.1+	33	5.53	7.78	13.31
<u>Junior High</u>	44	3.23	8.78	12.01
<u>NOP</u>				
267-400	10	3.46	9.34	12.80
401-600	15	3.38	9.31	12.69
601-800	15	3.13	7.83	10.96
801+	4	2.49	8.95	11.44
<u>TPS</u>				
15.0	1	2.99	7.47	10.46
15.1-30.0	18	3.31	9.33	12.64
30.1-45.0	22	3.13	8.16	11.29
45.1+	3	3.62	10.46	14.08
<u>Junior-Senior High</u>	7	5.29	10.49	15.78
<u>Senior High</u>	32	5.38	10.40	15.78
<u>NOP</u>				
90- 800	6	9.39	16.13	25.52
801-1600	19	4.64	8.91	13.55
1601+	7	3.96	9.53	13.49
<u>TPS</u>				
10.0- 50.0	7	7.93	13.64	21.55
50.1-100.0	20	4.59	9.20	13.79
100.1+	5	4.29	10.68	15.67

TABLE 6

MEAN PERCENTAGE OF TOTAL PAID STAFF TIME SPENT IN ADMINISTRATIVE,
SUPPORT AND NON-INSTRUCTIONAL POSITIONS

School Groupings	Total Number of Schools	Mean % of TPS Time Spent in Administrative Staff Positions	Mean % of TPS Time Spent in Support Staff Positions	Mean % of TPS Time Spent in Non-Instructional Staff Positions
<u>Elementary</u>	241	5.73	15.86	21.55
<u>NOP</u>				
8-250	79	6.09	19.30	25.39
251-500	122	5.65	14.45	20.10
501+	40	5.08	13.34	18.42
<u>TPS</u>				
1.0- 7.0	24	6.93	18.37	24.20
7.1-14.0	71	6.48	16.75	23.23
14.1+	146	5.29	15.01	20.30
<u>Elementary-Junior High</u>	82	6.34	13.71	20.05
<u>NOP</u>				
215-400	22	5.52	15.72	21.24
401-600	32	7.00	12.37	20.37
601-800	24	5.13	13.44	18.57
801+	4	4.76	15.01	19.77
<u>TPS</u>				
10.6-20.0	20	5.55	14.10	19.65
20.1-30.0	29	5.68	13.76	19.44
30.1+	33	7.39	13.43	20.82
<u>Junior High</u>	44	5.82	15.85	21.67
<u>NOP</u>				
267-400	10	6.21	16.64	22.85
401-600	15	5.90	16.39	22.29
601-800	15	5.77	14.61	20.38
801+	4	4.67	16.53	21.20
<u>TPS</u>				
15.0	1	5.60	14.00	19.60
15.1-30.0	18	6.02	16.91	22.94
30.1-45.0	22	5.67	14.82	20.49
45.1+	3	5.70	17.66	23.36
<u>Junior-Senior High</u>	7	8.95	17.61	26.56
<u>Senior High</u>	32	8.33	16.76	25.10
<u>NOP</u>				
90- 800	6	11.19	19.46	30.65
801-1600	19	8.06	16.20	24.26
1601+	7	6.63	15.98	22.61
<u>TPS</u>				
10.0-50.0	7	12.04	23.04	35.08
50.1-100.0	20	7.17	14.59	21.76
100.1+	5	7.79	16.68	24.47

TABLE 7

MEAN COST PER PUPIL OF IN-SCHOOL ADMINISTRATIVE, SUPPORT AND
NON-INSTRUCTIONAL PERSONNEL

School Grouping	Total Number of Schools	Mean Cost Admin. Staff/Pupil	Mean Cost Support Staff/Pupil	Mean Cost Non-Instructional Staff/Pupil
<u>Elementary</u>	241	\$ 45	\$ 36	\$ 81
<u>NOP</u>				
8-250	79	55	39	95
251-500	122	42	34	77
501+	40	35	33	68
<u>TPS</u>				
1.0- 7.0	24	54	28	82
7.1-14.0	71	53	35	88
14.1+	146	40	38	78
<u>Elementary-Junior High</u>	82	48	45	93
<u>NOP</u>				
215-400	22	46	49	95
401-600	32	58	46	104
601-800	24	38	38	77
801+	4	33	42	75
<u>TPS</u>				
10.6-20.0	20	43	41	84
20.1-30.0	29	42	45	87
30.1+	33	56	46	102
<u>Junior High</u>	44	46	57	104
<u>NOP</u>				
267-400	10	52	63	115
401-600	15	49	61	110
601-800	15	41	52	94
801+	4	38	53	91
<u>TPS</u>				
15.0	1	45	55	101
15.1-30.0	18	46	62	112
30.1-45.0	22	44	53	97
45.1+	3	42	61	104
<u>Junior-Senior High</u>	7	66	72	138
<u>Senior High</u>	32	70	70	140
<u>NOP</u>				
90-800	6	110	112	222
801-1600	19	64	59	123
1601+	7	53	62	116
<u>TPS</u>				
10.0- 50.0	7	95	91	187
50.1-100.0	20	62	63	125
100.1+	5	68	67	135

MEAN COST PER PAID STAFF MEMBER OF ADMINISTRATIVE, SUPPORT
AND NON-INSTRUCTIONAL PERSONNEL

School Groupings	Total Number of Schools	Mean Cost Admin. Staff/Paid Staff Member	Mean Cost Support Staff/Paid Staff Member	Mean Cost Non-Instructional Staff/Paid Staff Member
<u>Elementary</u>	241	\$ 889	\$ 682	\$ 1572
<u>NOP</u>				
8-250	79	970	636	1606
251-500	122	878	700	1578
501+	40	763	720	1484
<u>TPS</u>				
1.0- 7.0	24	967	495	1463
7.1-14.0	71	1018	616	1635
14.1+	146	813	746	1559
<u>Elementary-Junior High</u>	82	845	818	1663
<u>NOP</u>				
215-400	22	848	856	1704
401-600	32	920	816	1737
601-800	24	766	774	1541
801+	4	700	891	1591
<u>TPS</u>				
10.6-20.0	20	861	793	1655
20.1-30.0	29	809	854	1663
30.1+	33	867	802	1670
<u>Junior High</u>	44	836	1044	1880
<u>NOP</u>				
267-400	10	936	1119	2055
401-600	15	863	1075	1939
601-800	15	773	978	1751
801+	4	719	984	1703
<u>TPS</u>				
15.0	1	852	1040	1892
15.1-30.0	18	901	1137	2038
30.1-45.0	22	800	969	1770
45.1+	3	703	1031	1734
<u>Junior-Senior High</u>	7	1126	1208	2334
<u>Senior High</u>	32	1110	1124	2234
<u>NOP</u>				
90- 800	6	1292	1353	2646
801-1600	19	1128	1082	2210
1601+	7	904	1043	1947
<u>TPS</u>				
10.0- 50.0	7	1486	1553	3039
50.1-100.0	20	989	994	1983
100.1+	5	1067	1046	2114

Table 9 presents the Pearson Correlation Coefficients and probability levels between the numbers (F.T.E.) of administrative, support and non-instructional personnel per 1000 pupils and number of pupils: significance at the .01 and .05 levels is indicated throughout the reporting of the results.

Examination of Subproblems 1, 2, 3, 4, 5, and 6

This set of subproblems 1-6 relates to the number of staff per 1000 pupils.

Subproblem 1. The correlation coefficients between the number (F.T.E.) of administrative personnel per 1000 pupils and the number of pupils in elementary, junior and senior high schools were $-.40$, $-.49$ and $-.72$ respectively, all of which were significant at the .01 level. The correlation coefficients for elementary-junior high and junior-senior high schools were not significant at that level, being $-.11$ and $.07$ respectively.

Subproblem 2. With schools grouped according to the number of pupils, correlation coefficients between the number (F.T.E.) of administrative personnel per 1000 pupils and the number of pupils in elementary schools of 8-250; 251-500; elementary-junior high schools of 215-400 and senior high schools of 90-800, 801-1600 pupils were $-.36$, $-.36$, $-.48$, $-.96$ and $-.49$ respectively, all of which were significant at the .05 level. The correlation coefficients for elementary schools of 501+; elementary-junior high schools of 401-600, 601-800, 801+; junior high schools of 267-400, 401-600, 601-800, 801+; and senior high schools of 1601+ pupils were not significant at that level, being $-.24$, $.22$, $-.31$,

TABLE 9

PEARSON CORRELATION COEFFICIENTS BETWEEN THE NUMBERS (F.T.E.)
OF IN-SCHOOL ADMINISTRATIVE, SUPPORT AND NON-INSTRUCTIONAL
PERSONNEL PER 1000 PUPILS AND NUMBER OF PUPILS

School Groupings	Total Number of Schools	Number of Administrative Staff per 1000 Pupils		Number of Support Staff per 1000 Pupils		Number of Non-Instructional Staff per 1000 Pupils	
		r	p	r	p	r	p
<u>Elementary</u>	241	-.40	.01	-.20	.01	-.24	.01
<u>NOP</u>							
8-250	79	-.36	.01	-.18	.12	-.21	.07
251-500	122	-.36	.01	-.01	.91	-.08	.41
501+	40	-.24	.14	.07	.68	.04	.83
<u>TPS</u>							
1.0- 7.0	24	-.53	.01	-.29	.17	-.32	.13
7.1-14.0	71	-.53	.01	-.43	.01	-.47	.01
14.1+	146	-.39	.01	-.26	.01	-.31	.01
<u>Elementary-Junior High</u>	82	-.11	.35	-.18	.10	-.16	.14
<u>NOP</u>							
215-400	22	-.48	.02	-.14	.54	-.18	.43
401-600	32	.22	.22	.06	.76	.09	.64
601-800	24	-.31	.14	-.23	.27	-.28	.18
801+	4	.40	.61	-.04	.96	-.05	.59
<u>TPS</u>							
10.6-20.0	20	-.64	.01	-.27	.26	-.33	.15
20.1-30.0	29	-.52	.01	-.39	.04	-.47	.01
30.1+	33	-.28	.11	-.40	.02	-.45	.01
<u>Junior High</u>	44	-.49	.01	-.27	.08	-.33	.03
<u>NOP</u>							
267-400	10	.04	.92	-.28	.43	-.20	.58
401-600	15	-.13	.66	-.02	.96	.03	.92
601-800	15	-.10	.71	.10	.71	-.21	.46
801+	4	-.22	.78	-.26	.74	-.29	.71
<u>TPS</u>							
15.0	1	1.00	.01	1.00	.01	1.00	.01
15.1-30.0	18	-.38	.12	-.25	.31	-.29	.25
30.1-45.0	22	-.57	.01	-.65	.01	-.75	.01
45.1+	3	-.90	.29	.02	.99	-.57	.61
<u>Junior-Senior High</u>	7	.07	.88	-.25	.60	-.11	.82
<u>Senior High</u>	32	-.72	.01	-.58	.01	-.66	.01
<u>NOP</u>							
90- 800	6	-.96	.01	-.75	.09	-.87	.02
801-1600	19	-.49	.04	-.37	.12	-.50	.03
1601+	7	.61	.14	.67	.14	.63	.13
<u>TPS</u>							
10.0- 50.0	7	-.92	.01	-.75	.05	-.85	.02
50.1-100.0	20	-.77	.01	-.76	.01	-.83	.01
100.1+	5	-.54	.34	.41	.50	.22	.73

.40, .04, -.13, -.10, -.22, and .61 respectively.

With schools grouped according to total paid staff, correlation coefficients between the number (F.T.E.) of administrative personnel per 1000 pupils and the number of pupils in elementary schools of 1.0-7.0, 7.1-14.0, 14.1+; elementary-junior high schools of 10.6-20.0, 20.1-30.0; junior high schools of 30.1-45.0, and senior high schools of 10.0-50.0, 50.1-100.0 paid staff members were -.53, -.53, -.39, -.64, -.52, -.57, -.92 and -.77 respectively, all of which were significant at the .05 level. The correlation coefficients for elementary-junior high schools of 30.0+; junior high schools of 15.1-30.0, 45.1+ and senior high schools of 100.0+ paid staff members were not significant at that level, being -.28, -.38, -.90 and -.54.

Subproblem 3. The correlation coefficients between the number (F.T.E.) of support personnel per 1000 pupils and the number of pupils in elementary and senior high schools were -.20 and -.58 respectively, both of which were significant at the .01 level. The correlation coefficients for elementary-junior, junior high and junior-senior high schools were not significant at that level, being -.18, -.27 and -.25 respectively.

Subproblem 4. With schools grouped according to number of pupils, correlation coefficients between the number (F.T.E.) of support personnel per 1000 pupils and the number of pupils in elementary schools of 8-250, 251-500, 501+; elementary-junior high schools of 215-400, 401-600, 601-800, 801+; junior high schools of 267-400, 401-600, 601-800, 801+ and senior high schools of 90-800, 801-1600, 1601+ pupils were not

significant at the .05 level, being $-.18$, $-.01$, $.07$, $-.14$, $.06$, $-.23$, $-.04$, $-.28$, $-.02$, $.10$, $-.26$, $-.75$, $-.37$ and $.67$ respectively.

With schools grouped according to total paid staff, correlation coefficients between the number of (F.T.E.) support personnel per 1000 pupils and number of pupils in elementary schools of 7.1-14.0, 14.1+; elementary-junior high schools of 20.1-30.0, 30.1+; junior high schools of 30.1-45.0; senior high schools of 10.0-50.0, 50.1-100.0 paid staff members were $-.43$, $-.26$, $-.39$, $-.40$, $-.65$, $-.75$ and $-.76$, all of which were significant at the .05 level. The correlation coefficients for elementary schools of 1.0-7.0; elementary-junior high schools of 10.6-20.0; junior high schools of 15.1-30.0, 45.1+ and senior high schools of 100.0+ paid staff members were not significant at that level, being $-.29$, $-.27$, $-.25$, $.02$ and $.41$ respectively.

Subproblem 5. The correlation coefficients between the number (F.T.E.) of non-instructional personnel per 1000 pupils and number of pupils in elementary, junior high and senior high schools were $-.24$, $-.33$ and $-.66$ respectively, all of which were significant at the .05 level. The correlation coefficients for elementary-junior high and junior-senior high schools were not significant at that level being $-.16$ and $-.11$ respectively.

Subproblem 6. With schools grouped according to the number of pupils, correlation coefficients between the number (F.T.E.) of non-instructional personnel per 1000 pupils and the number of pupils in senior high schools of 90-800 and 801-1600 pupils were $-.87$ and $-.50$ respectively, both of which were significant at the .05 level. The

correlation coefficients for elementary schools of 8-250, 251-500, 501+; elementary-junior high schools of 215-400, 401-600, 601-800, 801+; junior high schools of 267-400, 401-600, 601-800, 801+ and senior high schools of 1601+ pupils were not significant at that level, being $-.21$, $-.08$, $.04$, $-.18$, $.09$, $-.28$, $-.05$, $-.20$, $.03$, $-.21$, $-.29$ and $.63$ respectively.

With the schools grouped according to total paid staff, correlation coefficients between the number (F.T.E.) of non-instructional personnel per 1000 pupils and the number of pupils in elementary schools of 7.1-14.0, 14.1+; elementary-junior high schools of 20.1-30.0, 30.1+; junior high schools of 30.1-45.1 and senior high schools of 10.0-50.0, 50.1-100.0 paid staff members were $-.47$, $-.31$, $-.47$, $-.45$, $-.75$, $-.85$ and $-.83$ respectively, all of which were significant at the .05 level. The correlation coefficients for elementary schools of 1.0-7.0; elementary-junior high schools of 10.6-20.0; junior high schools of 15.1-30.0, 45.1+ and senior high schools of 100.1+ paid staff members were not significant at that level, being $-.32$, $-.33$, $-.29$, $-.57$ and $.22$ respectively.

Discussion. Examination of the data relevant to subproblems 1, 2, 3, 4, 5, and 6 showed that for schools of elementary, junior high and senior high grade levels, the proportional sizes of the administrative component were negatively correlated with the numbers of pupils at the .01 level of significance. The elementary-junior high and junior-senior high school grade levels had correlations which were not significant at the .05 level. When the schools were grouped within grade levels by number of pupils, 5 out of a possible 14 groups showed

negative correlation at the .05 level of significance: 2 at the elementary grade level and 2 at the senior high grade level. When the schools were grouped according to total paid staff, 8 out of a possible 13 groups showed negative correlations at the .05 level of significance. This time all 3 groups at the elementary grade level showed significant correlations. A reason for the different number of significant correlations in the elementary grade level when grouped by number of pupils and then by total paid staff is that the groupings do not necessarily contain the same schools nor the same number of schools. For example:

Elementary Schools

NOP		# of Schools		TPS		# of Schools	
8-250		79	vs	1.0- 7.0		24	
251-500		122	vs	7.1-14.0		71	
501+		40	vs	14.1+		146	

The results obtained when the schools were grouped by total paid staff tend to support, to a larger extent, the findings at the grade level size than do those results obtained when the schools were grouped by number of pupils.

Negative correlation coefficients, at the .01 level of significance, between the number (F.T.E.) of support personnel per 1000 pupils and the number of pupils occurred in the elementary and senior high grade levels. The elementary-junior high, junior high and junior-senior high school grade levels had correlations which were not significant at that level. There were no significant correlation coefficients found when the schools were grouped by number of pupils. With the schools grouped by total paid staff, 7 out of a possible 12 groups contained significant

negative correlation coefficients at the .05 level.

The elementary, junior high and senior high school grade levels contained negative correlation coefficients between the number (F.T.E.) of non-instructional personnel per 1000 pupils and number of pupils at the .05 level of significance. The elementary-junior high and junior-senior high grade levels had correlation coefficients which were not significant at that level. When the schools were grouped by number of pupils, only two groups showed a negative correlation coefficient at the .05 level of significance. Of 12 groups 7 showed negative correlation coefficients, significant at the .05 level, when the schools were grouped by total paid staff.

Examination of Subproblems 7, 8, 9, 10, 11 and 12

This set of subproblems relates to the cost per pupil of staff.

Table 10 presents the Pearson Correlation Coefficients and probability levels between the cost per pupil of administrative, support and non-instructional personnel and number of pupils.

Subproblem 7. The correlation coefficients between the cost per pupil of administrative staff and number of pupils in elementary, junior high and senior high schools were $-.45$, $-.52$, and $-.65$ respectively, all of which were significant at the .01 level. The correlation coefficients for elementary-junior high and junior-senior high schools were not significant at this level, being $-.13$ and $-.04$ respectively.

Subproblem 8. With schools grouped according to the number of pupils, correlation coefficients between the cost per pupil of administrative personnel and the number of pupils in elementary schools of

TABLE 10

PEARSON CORRELATION COEFFICIENTS BETWEEN THE COST PER PUPIL OF
IN-SCHOOL ADMINISTRATIVE, SUPPORT AND NON-INSTRUCTIONAL
PERSONNEL AND NUMBER OF PUPILS

School Groupings	Total Number of Schools	Cost of Administrative Staff per 1000 Pupils		Cost of Support Staff per 1000 Pupils		Cost of Non-Instructional Staff per 1000 Pupils	
		r	p	r	p	r	p
<u>Elementary</u>	241	-.45	.01	-.09	.15	-.30	.01
<u>NOP</u>							
8-250	79	-.41	.01	-.13	.27	-.30	.01
251-500	122	-.40	.01	-.02	.80	-.18	.05
501+	40	-.31	.05	.09	.57	-.04	.82
<u>TPS</u>							
1.0- 7.0	24	-.55	.01	-.19	.36	-.57	.01
7.1-14.0	71	-.55	.01	-.49	.01	-.57	.01
14.1+	146	-.52	.01	-.27	.01	-.42	.01
<u>Elementary-Junior High</u>	82	-.13	.25	-.24	.03	-.21	.05
<u>NOP</u>							
215-400	22	-.50	.02	-.19	.39	-.32	.15
401-600	32	.14	.45	-.14	.43	.09	.62
601-800	24	-.27	.21	-.16	.47	-.31	.14
801+	4	-.03	.97	-.17	.83	-.12	.88
<u>TPS</u>							
10.6-20.0	20	-.68	.01	-.35	.14	-.51	.02
20.1-30.0	29	-.54	.01	-.59	.01	-.68	.01
30.1+	33	-.37	.03	-.56	.01	-.50	.03
<u>Junior High</u>	44	-.52	.01	-.35	.02	-.50	.01
<u>NOP</u>							
267-400	10	-.07	.85	-.32	.36	-.27	.46
401-600	15	-.11	.70	-.08	.77	-.12	.67
601-800	15	-.17	.55	-.21	.44	-.24	.39
801+	4	.01	.99	-.25	.75	-.26	.74
<u>TPS</u>							
15.0	1	1.00	.01	1.00	.01	1.00	.01
15.1-30.0	18	-.46	.05	-.16	.51	-.31	.21
30.1-45.0	22	-.61	.01	-.61	.01	-.70	.01
45.1+	3	-.83	.38	-.23	.85	-.84	.36
<u>Junior-Senior High</u>	7	-.04	.93	-.43	.34	-.28	.55
<u>Senior High</u>	32	-.65	.01	-.60	.01	-.69	.01
<u>NOP</u>							
90- 800	6	-.95	.01	-.69	.13	-.96	.01
801-1600	19	-.38	.11	-.32	.19	-.43	.07
1601+	7	.68	.10	.44	.32	.61	.15
<u>TPS</u>							
10.0-50.0	7	-.87	.01	-.74	.06	-.88	.01
50.1-100.0	20	-.70	.01	-.76	.01	-.83	.01
100.1+	5	-.86	.06	.29	.64	.08	.90

8-250, 251-500, 501+; elementary-junior high schools of 215-400 and senior high schools of 90-800 pupils were $-.41$, $-.40$, $-.31$, $-.50$ and $-.95$ respectively, all of which were significant at the .05 level. Correlation coefficients for elementary-junior high schools of 401-600, 601-800, 801+; junior high schools of 267-400, 401-600, 601-800, 801+ and senior high schools of 801-1600, 1601+ pupils were not significant at that level, being $.14$, $-.27$, $-.03$, $-.07$, $-.11$, $-.17$, $.01$, $-.38$ and $.68$ respectively.

With the schools grouped according to total paid staff, correlation coefficients between the cost per pupil of administrative personnel and the number of pupils in elementary schools of 1.0-7.0, 7.1-14.0, 14.1+; elementary-junior high schools of 10.6-20.0, 20.1-30.0, 30.1+; junior high schools of 15.1-30.0, 30.1-45.0 and senior high schools of 10.0-50.0, 50.1-100.0 paid staff members were $-.55$, $-.55$, $-.52$, $-.68$, $-.54$, $-.37$, $-.46$, $-.61$, $-.87$ and $-.70$ respectively, all of which were significant at the .05 level. The correlation coefficients for junior high schools of 45.1+, and senior high schools of 100.1+ paid staff members were not significant being $-.83$ and $-.86$ respectively.

Subproblem 9. The correlation coefficients between the cost per pupil of support staff and the number of pupils in elementary-junior high, junior high and senior high schools were $-.24$, $-.35$ and $-.60$ respectively, all of which were significant at the .05 level. The correlation coefficients for elementary and junior-senior high schools were not significant at this level, being $-.09$ and $-.43$ respectively.

Subproblem 10. With schools grouped according to number of

pupils, correlation coefficients between the cost per pupil of support personnel and the number of pupils in the elementary schools of 8-250, 251-500, 501+; elementary-junior high schools of 215-400, 401-600, 601-800, 801+; junior high schools of 267-400, 401-600, 601-800, 801+ and senior high schools of 90-800, 801-1600, 1601+ pupils were not significant at the .05 level, being $-.13$, $-.02$, $.09$, $-.19$, $-.14$, $-.16$, $-.17$, $-.32$, $-.08$, $-.21$, $-.25$, $-.69$, $-.32$ and $.44$ respectively.

With schools grouped according to total paid staff, correlation coefficients between the cost per pupil of support personnel and the number of pupils in elementary schools of 7.1-14.0, 14.1+; elementary-junior high schools of 20.1-30.0, 30.1+; junior high schools of 30.1-45.0 and senior high schools of 50.1-100.0 paid staff members were $-.49$, $-.27$, $-.59$, $-.56$, $-.61$ and $-.76$ respectively, all of which were significant at the .01 level. The correlation coefficients for elementary schools of 1.0-7.0; elementary-junior high schools of 10.6-20.0; junior high schools of 15.1-30.0, 45.1+ and senior high schools of 10.0-50.0, 100.0+ paid staff members were not significant at that level, being $-.19$, $-.35$, $-.16$, $-.23$, $-.74$ and $-.29$ respectively.

Subproblem 11. The correlation coefficients between the cost per pupil of non-instructional personnel and number of pupils in elementary, elementary-junior high, junior high and senior high schools were $-.30$, $-.21$, $-.50$ and $-.69$ respectively, all of which were significant at the .05 level. The correlation coefficient for junior-senior high schools was not significant at that level, being $-.28$.

Subproblem 12. With the schools grouped according to number of

pupils, the correlation coefficients between the cost per pupil of non-instructional personnel and number of pupils in elementary schools of 8-250, 251-500 and senior high schools of 801-1600 pupils were $-.30$, $-.18$ and $-.96$ respectively, all of which were significant at the $.05$ level. The correlation coefficients for elementary schools of 501+; elementary-junior high schools of 215-400, 401-600, 601-800, 801+; junior high schools of 267-400, 401-600, 601-800, 801+ and senior high schools of 801-1600, 1601+ pupils were not significant at that level, being $-.04$, $-.32$, $.09$, $-.31$, $-.12$, $-.27$, $-.12$, $-.24$, $-.26$, $-.43$ and $.61$ respectively.

With schools grouped according to total paid staff the correlation coefficients between the cost per pupil of non-instructional personnel and number of pupils in elementary schools of 1.0-7.0, 7.1-14.0, 14.1+; elementary-junior high schools of 10.6-20.0, 20.1-30.0, 30.1+; junior high schools of 30.1-45.0 and senior high schools of 10.0-50.0, 50.1-100.0 paid staff members were $-.57$, $-.57$, $-.42$, $-.51$, $-.68$, $-.50$, $-.70$, $-.88$ and $-.83$ respectively, all of which were significant at the $.05$ level. The correlation coefficients for junior high schools of 15.1-30.0, 45.1+ and senior high schools of 100.0+ paid staff members were not significant at that level, being $-.31$, $-.84$ and $.08$ respectively.

Discussion. Examination of the data relevant to subproblems 7, 8, 9, 10, 11 and 12 showed that for the elementary, junior high and senior high school grade levels negative correlations between the cost per pupil of administrative staff and the number of pupils occurred at the $.01$ level of significance. The elementary-junior high and junior-

senior high school grade levels had correlations which were not significant at that level. With the schools grouped according to number of pupils 5 out of 14 groups showed negative correlations significant at the .05 level. When the schools were grouped according to total paid staff 10 out of 12 groups had negative correlation coefficients significant at the .05 level.

Negative correlation coefficients between the cost per pupil of support personnel and number of pupils occurred in the elementary-junior high, junior high and senior high school grade levels at the .05 level of significance. Elementary and junior-senior high school grade levels had correlation coefficients which were not significant at that level. When the schools were divided into groups by number of pupils none of the groups were found to contain a correlation coefficient significant at the .05 level. With the schools grouped according to total paid staff 6 out of 12 groups were found to have negative correlations significant at the .01 level.

Elementary, elementary-junior high, junior high and senior high school grade levels had negative correlation coefficients between the cost per pupil of non-instructional personnel and number of pupils at the .05 level of significance. The junior-senior high school grade levels had a correlation coefficient which was not significant at that level. There were 3 significant negative correlation coefficients found at the .05 level, when the schools were grouped according to number of pupils. When the schools were grouped according to total paid staff 9 out of 12 groups showed negative correlation coefficients at the .05 level of significance.

Examination of Subproblems 13, 14, 15, 16, 17 and 18

This set of subproblems related to percentage of total paid staff time spent in administrative, support and non-instructional positions.

Table 11 presents the Pearson Correlation Coefficients and probability levels between the percentage of total paid staff time spent in administrative, support and non-instructional positions and total paid staff.

Subproblem 13. The correlation coefficients between the percentage of total paid staff time spent in administrative positions and total paid staff in elementary, junior high and senior high schools were $-.33$, $-.46$ and $-.59$ respectively, all of which were significant at the $.05$ level. The correlation coefficients for elementary-junior high and junior-senior high schools were not significant at that level, being $.06$ and $.14$ respectively.

Subproblem 14. With schools grouped according to number of pupils, correlation coefficients between the percentage of total paid staff time in administrative positions and total paid staff in elementary schools of 8-250, 251-500; elementary-junior high schools of 215-400, 601-800 and senior high schools of 801-1600 pupils were $-.24$, $-.31$, $-.47$, $.50$ and $-.53$ respectively, all of which were significant at the $.05$ level. The correlation coefficients for elementary schools of 501+, elementary-junior high schools of 401-600, 801+; junior high schools of 267-400, 401-600, 601-800, 801+ and senior high schools of 90-800, 1601+ pupils were not significant at that level, being $-.29$,

TABLE 11

PEARSON CORRELATION COEFFICIENTS BETWEEN THE PERCENTAGE OF TOTAL
PAID STAFF TIME SPENT IN ADMINISTRATIVE, SUPPORT AND NON-
INSTRUCTIONAL POSITIONS AND TOTAL PAID STAFF

School Groupings	Total Number of Schools	Administrative Staff Time		Support Staff Time		Non-Instructional Staff Time	
		r	p	r	p	r	p
<u>Elementary</u>	241	-.33	.01	-.09	.14	-.13	.05
<u>NOP</u>							
8-250	79	-.24	.03	-.03	.80	-.05	.67
251-500	122	-.31	.01	.18	.05	.13	.16
501+	40	-.29	.07	.18	.26	.14	.41
<u>TPS</u>							
1.0- 7.0	24	-.01	.98	-.21	.33	-.21	.32
7.1-14.0	71	-.20	.09	-.06	.62	-.09	.47
14.1+	146	-.29	.01	-.09	.30	-.12	.16
<u>Elementary-Junior High</u>	82	.06	.57	-.07	.51	.19	.09
<u>NOP</u>							
215-400	22	-.47	.03	.27	.22	.23	.31
401-600	32	.17	.36	-.31	.08	.48	.01
601-800	24	.50	.01	.11	.60	.21	.33
801+	4	.53	.47	.40	.60	.35	.65
<u>TPS</u>							
10.6-20.0	20	-.61	.01	.20	.40	.11	.64
20.1-30.0	29	.06	.76	.14	.46	.14	.48
30.1+	33	.11	.53	-.31	.08	.34	.05
<u>Junior High</u>	44	-.46	.02	-.24	.12	-.29	.06
<u>NOP</u>							
267-400	10	-.14	.71	-.28	.43	-.26	.47
401-600	15	-.17	.54	-.37	.18	-.36	.19
601-800	15	-.21	.45	-.51	.05	-.38	.16
801+	4	-.54	.46	.38	.62	.30	.70
<u>TPS</u>							
15.0	1	1.00	.01	1.00	.01	1.00	.01
15.1-30.0	8	-.32	.19	-.12	.64	-.18	.48
30.1-45.0	22	-.32	.14	-.55	.01	-.65	.01
45.1+	3	.50	.67	-.39	.74	-.66	.54
<u>Junior-Senior High</u>	7	.14	.76	-.09	.86	.06	.90
<u>Senior High</u>	32	-.59	.01	-.36	.04	-.47	.01
<u>NOP</u>							
90- 800	6	-.40	.43	-.39	.45	-.56	.25
801-1600	19	-.53	.02	-.65	.01	-.67	.01
1601+	7	.71	.08	.77	.04	.79	.04
<u>TPS</u>							
10.0-50.0	7	-.70	.08	-.23	.62	-.35	.44
50.1-100.0	20	-.23	.32	-.21	.38	-.29	.21
100.1+	5	-.40	.50	.64	.25	.52	.37

.17, .53, -.14, -.17, -.21, -.54 and .71 respectively.

With the schools grouped according to total paid staff, correlation coefficients between the percentage of total paid staff time spent in administration and total paid staff for elementary schools of 14.1+ and elementary-junior high schools of 10.6-20.0 paid staff members were -.29 and -.61 respectively, both of which were significant at the .01 level. The correlation coefficients for elementary schools of 1.0-7.0, 7.1-14.0; elementary-junior high schools of 20.1-30.0, 30.1+; junior high schools of 15.1-30.0, 30.1-45.0, 45.1+ and senior high schools of 10.0-50.0, 50.1-100.0, 100.1+ paid staff members were not significant at that level, being -.01, -.20, .06, .11, -.32, -.32, .50, -.70, -.23 and -.40 respectively.

Subproblem 15. The correlation coefficients between the percentage of total paid staff time spent in support positions and total paid staff in senior high schools was -.36, being significant at the .05 level. The correlation coefficients for elementary, elementary-junior high, junior high and junior-senior high schools were not significant at that level, being -.09, -.07, -.24 and -.09 respectively.

Subproblem 16. With the schools grouped according to number of pupils, the correlation coefficients between the percentage of total paid staff time spent in support positions and total paid staff in elementary schools of 251-500, junior high schools of 601-800 and senior high schools of 801-1600, 1601+ pupils were .18, -.51, -.65 and .77 all of which were significant at the .05 level. The correlation coefficients for elementary schools of 8-250, 501+; elementary-junior

high schools of 215-400, 401-600, 601-800, 801+; junior high schools of 267-400, 401-600, 801+ and senior high schools of 90-800 pupils were not significant at that level, being $-.03$, $.18$, $.27$, $-.31$, $.11$, $.40$, $-.28$, $-.37$, $.38$ and $-.39$ respectively.

With schools grouped according to total paid staff, correlation coefficient between the percentage of total paid staff time spent in support positions and total paid staff in junior high schools of 30.1-45.0 was $-.55$, being significant at the $.01$ level. The correlation coefficients for elementary schools of 1.0-7.0, 7.1-14.0, 14.1+; elementary-junior high schools of 10.6-20.0, 20.1-30.0, 30.1+; junior high schools of 15.1-30.0, 45.1+ and senior high schools of 10.0-50.0, 50.1-100.0, 100.1+ paid staff members were not significant at that level, being $-.21$, $-.06$, $-.09$, $.20$, $.14$, $-.31$, $-.12$, $-.39$, $-.23$, $-.21$ and $.64$ respectively.

Subproblem 17. The correlation coefficients between the percentage of total paid staff time spent in non-instructional positions and total paid staff in elementary and senior high schools were $-.13$ and $-.47$ respectively, both of which were significant at the $.05$ level. The correlation coefficients for elementary-junior high, junior high and junior-senior high schools were not significant at that level being $.19$, $-.29$ and $.06$ respectively.

Subproblem 18. With the schools grouped according to the number of pupils, correlation coefficients between the percentage of total paid staff time spent in non-instructional positions and total paid staff in elementary-junior high schools of 401-600 and senior high schools of

801-1600, 1601+ pupils were .48, -.67 and .79 respectively, all of which were significant at the .05 level. The correlation coefficients for elementary schools of 8-250, 251-500, 501+; elementary-junior high schools of 215-400, 601-800, 800+; junior high schools of 267-400, 401-600, 601-800, 801+ and senior high schools of 90-800 pupils were not significant at that level, being -.05, .13, .14, .23, .21, .35, -.36, -.38, .30 and -.56 respectively.

With schools grouped according to total paid staff, correlation coefficients between the percentage of total paid staff time spent in non-instructional positions and total paid staff in elementary-junior high schools of 30.1+ and junior high schools of 30.1-45.0 paid staff members were .34 and -.65 respectively, both of which were significant at the .05 level. The correlation coefficients for elementary schools of 1.0-7.0, 7.1-14.0, 14.1+; elementary-junior high schools of 10.6-20.0, 20.1-30.0; junior high schools of 15.1-30.0, 45.1+ and senior high schools of 10.0-50.0, 50.1-100.0, 100.1+ paid staff members were not significant at that level, being -.21, -.09, -.12, .11, .14, -.18, -.66, -.35, -.29 and .52 respectively.

Discussion. Examination of the data relevant to subproblems 13, 14, 15, 16, 17 and 18 showed that for elementary, junior high and senior high school grade levels negative correlations between the percentage of total paid staff time spent in administrative positions and total paid staff occurred at the .05 level of significance. The correlation coefficients for elementary-junior high and junior-senior high grade levels were not significant at that level. With schools grouped according to number of pupils 4 out of 14 groups showed

negative correlation coefficients with one group (elementary-junior high schools of 601-800 pupils) showing a positive correlation coefficient at the .05 level of significance. When the schools were grouped according to total paid staff 2 out of 12 groups showed negative correlation coefficients at the .01 level of significance.

The correlation coefficient between the percentage of total paid staff time spent in support positions and total paid staff in the senior high school grade level was negative and significant at the .05 level. The elementary, elementary-junior high, junior high and junior-senior high school grade levels had correlation coefficients which were not significant at that level. When the schools were grouped by number of pupils there were 2 negative and 2 positive correlation coefficients out of 14 groups at the .05 level of significance. With the schools grouped according to total paid staff only 1 group out of 12 was found to have a negative correlation at the .01 level of significance.

The elementary and senior high school grade levels were found to have **negative** correlation coefficients between the percentage of total paid staff time spent in non-instructional positions and total paid staff at the .05 level of significance. The elementary-junior high, junior high and junior-senior high school grade levels had correlation coefficients which were not significant at that level. With schools grouped according to number of pupils 1 out of 14 groups had a negative correlation coefficient and 2 had positive correlation coefficients at the .05 level of significance. When the schools were grouped by total paid staff, only 2 groups, one with a positive correlation coefficient and one with a negative correlation coefficient, out

of 12 groups showed significant correlations at the .05 level.

Examination of Subproblems 19, 20, 21, 22, 23 and 24

This set of subproblems relates to the cost per paid staff member of administrative, support and non-instructional personnel.

Table 12 presents the Pearson Correlation Coefficients between the cost per paid staff member of administrative, support and non - instructional personnel and total paid staff.

Subproblem 19. The correlation coefficients between the cost per paid staff member of administrative personnel and total paid staff in elementary, junior high and senior high schools were $-.42$, $-.49$ and $-.50$ respectively, all of which were significant at the .01 level. The correlation coefficients for elementary-junior high and junior-senior high schools were not significant at that level, being $.15$ and $.04$ respectively.

Subproblem 20. With the schools grouped according to number of pupils, correlation coefficients between cost per paid staff member of administrative personnel and total paid staff in elementary schools of 8-250, 251-500, 501+, elementary-junior high schools of 215-400, 601-800 and senior high schools of 90-800, 801-1600 were $-.30$, $-.43$, $-.37$, $-.49$, $.47$, $-.94$ and $-.54$ respectively, all of which were significant at the .05 level. The correlation coefficients for elementary-junior high schools of 401-600, 801+, junior high schools of 267-400, 401-600, 601-800, 801+ and senior high schools of 1601+ pupils were not significant at that level, being $.32$, $.01$, $-.18$, $-.22$, $-.20$, $-.41$ and $.66$.

TABLE 12

PEARSON CORRELATION COEFFICIENTS BETWEEN THE COST PER PAID
STAFF MEMBER OF IN-SCHOOL ADMINISTRATIVE, SUPPORT AND
NON-INSTRUCTIONAL PERSONNEL AND TOTAL PAID STAFF

School Groupings	Total Number of Schools	Administrative Staff Cost per Paid Staff Member		Support Staff Cost per Paid Staff Member		Non-Instructional Staff Cost per Paid Staff Member	
		r	p	r	p	r	p
<u>Elementary</u>	241	-.42	.01	.16	.01	-.10	.14
<u>NOP</u>							
8-250	79	-.30	.01	.08	.50	-.11	.34
251-500	122	-.43	.01	.26	.01	.03	.75
501+	40	-.37	.02	.43	.01	.21	.19
<u>TPS</u>							
1.0- 7.0	24	-.14	.51	.09	.68	-.00	.99
7.1-14.0	71	-.20	.09	.09	.44	-.04	.74
14.1+	146	-.42	.01	-.05	.53	-.23	.01
<u>Elementary-Junior High</u>	82	.15	.19	-.12	.30	.05	.64
<u>NOP</u>							
215-400	22	-.49	.02	.35	.11	.10	.67
401-600	32	.32	.07	-.41	.02	.14	.46
601-800	24	.47	.02	.32	.12	.52	.01
801+	4	.01	.99	.33	.67	.25	.75
<u>TPS</u>							
10.6-20.0	20	-.62	.01	.17	.47	-.14	.55
20.1-30.0	29	.01	.95	.02	.92	.02	.91
30.1+	33	.27	.13	-.40	.02	.11	.56
<u>Junior High</u>	44	-.49	.01	-.32	.03	-.46	.01
<u>NOP</u>							
267-400	10	-.18	.62	-.19	.60	-.21	.56
401-600	15	-.22	.43	-.45	.09	-.45	.10
601-800	15	-.20	.47	-.50	.06	-.46	.09
801+	4	-.41	.59	.39	.61	.20	.80
<u>TPS</u>							
15.0	1	1.00	.01	1.00	.01	1.00	.01
15.1-30.0	18	-.38	.12	.01	.98	-.17	.50
30.1-45.0	22	-.40	.06	-.48	.02	-.53	.01
45.1+	3	.33	.79	-.40	.74	-.43	.72
<u>Junior-Senior High</u>	7	.04	.93	-.34	.46	-.15	.75
<u>Senior High</u>	32	-.50	.01	-.39	.03	-.48	.01
<u>NOP</u>							
90- 800	6	-.94	.01	-.25	.63	-.71	.11
801-1600	19	-.54	.02	-.63	.01	-.64	.01
1601+	7	.66	.10	.54	.21	.76	.05
<u>TPS</u>							
10.0- 50.0	7	-.66	.11	-.22	.64	-.41	.36
50.1-100.0	20	-.16	.51	-.23	.33	-.26	.27
100.1+	5	-.78	.12	.69	.21	.53	.36

With schools grouped according to total paid staff, correlation coefficients between the cost per paid staff member and total paid staff in elementary schools of 14.1+ and elementary-junior high schools of 10.6-20.0 paid staff members were $-.42$ and $-.62$ respectively, both of which were significant at the $.01$ level. The correlation coefficients for elementary schools of 1.0-7.0, 7.1-14.0; elementary-junior high schools of 20.1-30.0, 30.1+; junior high schools of 15.1-30.0, 30.1-45.0, 45.1+ and senior high schools of 10.0-50.0, 50.1-100.0, 100.1+ were not significant at that level, being $-.14$, $-.20$, $.01$, $.27$, $-.38$, $-.40$, $.33$, $-.66$, $-.16$ and $-.78$ respectively.

Subproblem 21. The correlation coefficients between the cost per paid staff member of support personnel and total paid staff in elementary, junior high and senior high schools were $.16$, $-.32$ and $-.39$ respectively, all of which were significant at the $.05$ level. The correlation coefficients for elementary-junior high and junior-senior high schools were not significant at that level, being $-.12$ and $-.34$ respectively.

Subproblem 22. With the schools grouped according to number of pupils, correlation coefficients between the cost per paid staff member of support personnel and total paid staff in elementary schools of 251-500, 501+; elementary-junior high schools of 401-600 and senior high schools of 801-1600 pupils were $.26$, $.43$, $-.41$, and $-.63$ respectively, all of which were significant at the $.05$ level. The correlation coefficients for elementary schools of 8-250; elementary-junior high schools of 215-400, 601-800, 801+; junior high schools of 267-400,

401-600, 601-800, 801+ and senior high schools of 90-800, 1601+ pupils were not significant at that level, being .08, .35, .32, .33, -.19, -.45, -.50, .39, -.25 and .54 respectively.

With the schools grouped according to total paid staff, correlation coefficients between the cost per paid staff member of support personnel and total paid staff for elementary-junior high schools of 30.1+; junior high schools of 30.1-45.0 paid staff members were -.40 and -.48 respectively, both of which were significant at the .05 level. The correlation coefficients for elementary schools of 1.0-7.0, 7.1-14.0, 14.1+; elementary-junior high schools of 10.6-20.0, 20.1-30.0; junior high schools of 15.1-30.0, 45.1+ and senior high schools of 10.0-50.0, 50.1-100.0, 100.1+ paid staff members were not significant at that level, being .09, .09, -.05, .17, .02, .01, -.40, -.22, -.23 and .69 respectively.

Subproblem 23. The correlation coefficients between the cost per paid staff member of non-instructional personnel and total paid staff in junior high and senior high schools were -.46 and -.48, both of which were significant at the .01 level. The correlation coefficients for elementary, elementary-junior high and junior-senior high schools were not significant at that level, being -.10, .05 and -.15 respectively.

Subproblem 24. With the schools grouped according to number of pupils, the correlation coefficients between the cost per paid staff member of non-instructional personnel and total paid staff for elementary-junior high schools of 601-800 and senior high schools of 801-1600,

1601+ pupils were .52, $-.64$ and $.76$ respectively, all of which were significant at the .05 level. The correlation coefficients for elementary schools of 8-250, 251-500, 501+; elementary-junior high schools of 215-400, 401-600, 801+; junior high schools of 267-400, 401-600, 601-800, 801+ and senior high schools of 90-800 pupils were not significant at that level, being $-.11$, $.03$, $.21$, $.10$, $.14$, $.25$, $-.21$, $-.45$, $-.46$, $.20$ and $-.71$ respectively.

With schools grouped according to total paid staff, the correlation coefficients between the cost per paid staff member of non-instructional personnel and total paid staff for elementary schools of 14.1+ and junior high schools of 30.1-45.0 paid staff members were $-.23$ and $-.53$ respectively, both of which were significant at the .01 level. The correlation coefficients for elementary schools of 1.0-7.0, 7.1-14.0; elementary-junior high schools of 10.6-20.0, 20.1-30.0, 30.1+; junior high schools of 15.1-30.0, 45.1+, and senior high schools of 10.0-50.0, 50.1-100.0, 100.1+ paid staff members were not significant at that level, being $-.00$, $-.04$, $-.14$, $.02$, $.11$, $-.17$, $-.43$, $-.41$, $-.26$ and $.53$ respectively.

Discussion. Examination of data relevant to subproblems 19, 20, 21, 22, 23 and 24 showed that for elementary, junior high and senior high school grade levels there were negative correlation coefficients between the cost per paid staff member of administrative personnel and total paid staff at the .01 level of significance. The elementary-junior high and junior-senior high grade levels had correlations which were not significant at the .01 level. With the schools grouped according to number of pupils, 7 out of 14 groups had negative correlation

coefficients significant at the .05 level. When the schools were grouped according to total paid staff, 2 out of 12 groups had negative correlations significant at the .01 level.

Negative correlation coefficients between the cost per paid staff member of support personnel and total paid staff were found for junior high and senior high grade levels at the .05 level of significance. The elementary grade level was found to have a positive correlation at the .01 level of significance. The elementary-junior high and junior-senior high school grade levels had correlations which were not significant at that level. When the schools were grouped according to number of pupils 4 out of 14 groups had correlation coefficients, two of which were positive and two of which were negative, at the .05 level of significance. With the schools grouped according to total paid staff 2 out of 12 groups had negative correlations significant at the .05 level.

The junior high and senior high school grade levels were found to have negative correlation coefficients between the cost per paid staff of non-instructional personnel and total paid staff at the .01 level of significance. With the schools grouped according to number of pupils there were two groups with positive correlation coefficients and one group with a negative correlation coefficient out of 14 at a .05 level of significance. When the schools were grouped according to total paid staff only 2 out of 12 groups had correlation coefficients significant at the .01 level.

SUMMARY OF CHAPTER 4

The analysis in this chapter were aimed at determining the

Pearson Correlation Coefficients between (1) the number (F.T.E.) of in-school administrative, support and non-instructional personnel per 1000 pupils, and number of pupils; (2) the cost per pupil of in-school administrative, support and non-instructional personnel, and number of pupils; (3) the percentage of total paid staff time spent in administrative, support and non-instructional positions, and total paid staff and (4) the cost per paid staff member of administrative, support and non-instructional personnel, and total paid staff for various size groupings. Table 13 summarizes the Pearson Correlation Coefficients by grade level.

Administrative Component

By examining the correlation coefficients between (1) the number (F.T.E.) of administrative personnel per 1000 pupils and number of pupils; and (2) the percentage of total paid staff time spent on administrative positions and total paid staff, it was found that the elementary, junior high and senior high grade levels had negative correlation coefficients at the .01 level of significance in the first case and at the .05 level of significance in the second case. In both sets of correlation coefficients analyzed, the elementary-junior high and the junior-senior high had correlation coefficients which were not significant at the .05 level. When the schools were grouped within the grade levels, either by number of pupils or total paid staff, only the elementary groupings by total paid staff supported the findings at the grade level size when it was shown that each of the three groups had negative correlations at the .05 level of significance.

The elementary, junior high and senior high school grade levels

TABLE 13
SUMMARY OF PEARSON CORRELATION COEFFICIENTS BY GRADE LEVEL

	Elementary		Elementary- Junior High		Junior High		Junior- Senior High		Senior High	
	r	p	r	p	r	p	r	p	r	p
Admin. Nos. Per 1000 Pupils <u>Vs</u> No. of Pupils	-.40	.01	-.11	.35	-.49	.01	.07	.88	-.72	.01
Admin. Time Per Paid Staff Member <u>VS</u> Total Paid Staff	-.33	.01	.06	.57	-.46	.02	.14	.76	-.59	.01
Admin. Cost Per 1000 Pupils <u>VS</u> No. of Pupils	-.45	.01	-.13	.25	-.52	.01	-.04	.93	-.65	.01
Admin. Cost Per Paid Staff Member <u>VS</u> Total Paid Staff	-.42	.01	.15	.19	-.49	.01	.04	.93	-.50	.01
Support Nos. Per 1000 Pupils <u>VS</u> No. of Pupils	-.20	.01	-.18	.10	-.27	.08	-.25	.60	-.58	.01
Support Time Per Paid Staff Member <u>VS</u> Total Paid Staff	-.09	.14	-.07	.51	-.24	.12	-.09	.86	-.36	.04
Support Cost Per 1000 Pupils <u>VS</u> No. of Pupils	-.09	.15	-.24	.03	-.35	.02	-.43	.34	-.60	.01
Support Cost Per Paid Staff Member <u>VS</u> Total Paid Staff	.16	.01	-.12	.30	-.32	.03	-.34	.46	-.39	.03
Non-Inst. Nos. Per 1000 Pupils <u>VS</u> No. of Pupils	-.24	.01	-.16	.14	-.33	.03	-.11	.82	-.66	.01
Non-Inst. Time Per Paid Staff Member <u>VS</u> Total Paid Staff	-.13	.05	.19	.09	-.29	.06	.06	.90	-.47	.01
Non-Inst. Cost Per 1000 Pupils <u>VS</u> No. of Pupils	-.30	.01	-.21	.05	-.50	.01	-.28	.55	-.69	.01
Non-Inst. Cost Per Paid Staff Member <u>VS</u> Total Paid Staff	-.10	.14	.05	.64	-.46	.01	-.15	.75	-.48	.01

were also found to have negative correlation coefficients at the .01 level of significance when the correlation coefficients between (1) the cost per pupil of administrative personnel and number of pupils; and (2) the cost per paid staff member of administrative personnel and total paid staff were analyzed at the grade level size. The elementary-junior high and junior-senior high had correlation coefficients which were not significant at the .01 level in both cases. Support for the findings at the grade level size arises when examining the schools grouped by total paid staff. In 10 out of 12 groups negative correlation coefficients between the cost per pupil of administrative personnel and number of pupils at the .05 level of significance were found.

Support Component

The elementary and senior high school grade levels were found to have negative correlations between the number (F.T.E.) of support personnel per 1000 pupils and number of pupils at the .01 level of significance. When examining correlation coefficients between the percentage of total paid staff time spent on support positions and total paid staff only the senior high school grade level had a negative correlation coefficient significant at the .05 level. The elementary grade level in the second set of correlation coefficients, as with the elementary-junior high, junior high and junior-senior high school grade levels in both sets of correlation coefficients, had correlation coefficients which were not significant at that level. There was no support forthcoming for the significant correlation coefficients at the grade level size when the schools were grouped according to either number of pupils or total paid staff, due to the minor number of

significant correlation coefficients found with these groupings.

The elementary-junior high, junior high and senior high school grade levels were found to have negative correlation coefficients between the cost per pupil of support personnel and number of pupils at the .05 level of significance. When the correlation coefficients between the cost per paid staff member of support personnel and total paid staff were examined, the junior high and senior high school grade levels had negative correlation coefficients at the .05 level of significance while the elementary school grade level had a positive correlation coefficient at the .01 level of significance. When the grade levels were divided into groups either by number of pupils or total paid staff, there were only a minor number of significant correlation coefficients found and this did not support findings at the grade level size.

Non-Instructional Component

The elementary, junior high and senior high school grade levels contained negative correlation coefficients between the number (F.T.E.) of non-instructional personnel per 1000 pupils and number of pupils at the .05 level of significance. Negative correlation coefficients, significant at the .05 level, were found between the percentage of total paid staff time spent on non-instructional positions and total paid staff in both the elementary and senior high school grade levels. When the schools were grouped according to number of pupils or total paid staff, there was no support for the findings at the grade level size as only a small number of significant correlation coefficients found.

The elementary, elementary-junior high, junior high and senior high school grade levels had negative correlation coefficients between the cost per pupil of non-instructional personnel and number of pupils at the .05 level of significance. The correlation coefficients between the cost per paid staff member of non-instructional personnel and total paid staff in the junior high and senior high school grade levels were found to have negative correlation coefficients at the .01 level of significance. The correlation coefficients in the remaining grade level groupings had correlation coefficients which were not significant at the .05 level. When all the schools were grouped either by number of pupils or total paid staff, those correlation coefficients between the cost per pupil of non-instructional personnel and number of pupils for the school groupings by total paid staff in the elementary and elementary-junior high grade levels supported the findings at the grade level size.

CHAPTER 5

ADEQUACY OF TIME ALLOTMENTS

The principals were asked to check one of two possible answers, (1) "sufficient time," or (2) "more time needed" to indicate their assessment of the amount of time provided for the categories of (1) administration and (2) staff supervision. For the remaining categories of guidance, library, audio-visual, teacher aides (paid), teacher aides (voluntary), laboratory assistants, and clerical personnel, the principals were asked to check one of three possible answers: (1) "sufficient time," (2) "more time needed," and (3) "not applicable," to indicate their assessment of the amount of time provided each of those categories. From the answers, percentage frequency distributions were produced as shown in Table 14.

When schools were divided into groups within the grade levels by total paid staff, the percentage response results in categories (1) sufficient time, (2) more time needed, and (3) not applicable, generally were similar in all positions examined - administration, supervision, guidance, library, audio-visual, paid teacher aides, voluntary teacher aides, laboratory assistants, and clerical personnel. For this reason, and because of the large amount of data, only the overall results obtained at the grade level size and certain gross differences are discussed in detail.

TABLE 14

PERCENTAGE DISTRIBUTIONS OF OPINIONS OF PRINCIPALS CONCERNING AMOUNT OF TIME
ALLOTTED FOR PERSONNEL TO PERFORM ADMINISTRATIVE AND SUPPORT FUNCTIONS

SCHOOL GROUPING	No. of Schools	ADMINISTRATION				STAFF SUPERVISION				GUIDANCE			
		Mean % TPS Time	Suff. %	More Time %	NA %	Mean % TPS Time	Suff. %	More Time %	NA %	Mean % TPS Time	Suff. %	More Time %	NA %
<u>ELEMENTARY</u>	241	5.73	50	50	0		30	70	0	.17	11	47	42
<u>TPS</u>						-							
1.0-7.0	24	6.93	58	42	0		42	58	0	.07	13	33	54
7.1-14.0	71	6.48	49	51	0		31	69	0	.13	14	35	51
14.1+	146	5.29	49	51	0		27	73	0	.21	10	54	36
<u>ELEM-JHS</u>	82	6.34	48	52	0		26	74	0	1.85	45	40	15
<u>TPS</u>						-							
10.6-20.0	20	5.55	40	60	0		20	80	0	1.41	15	50	35
20.1-30.0	29	5.68	45	55	0		31	69	0	1.93	52	38	10
30.1+	33	7.39	54	46	0		24	76	0	2.03	58	36	6
<u>JHS</u>	44	5.82	48	52	0		21	79	0	2.99	41	57	2
<u>TPS</u>						-							
15.0	1	5.60	100	0	0		0	100	0	3.67	100	0	0
15.1-30.0	18	6.02	44	56	0		28	72	0	2.89	39	61	0
30.1-45.0	22	5.67	50	50	0		14	86	0	3.01	41	55	5
45.1+	3	5.70	33	67	0		33	67	0	3.16	33	67	0
<u>JHS-SHS</u>	7	8.95	57	43	0		29	71	0	3.65	43	43	14
<u>SHS</u>	32	8.33	72	28	0		25	75	0	3.93	38	53	9
<u>TPS</u>						-							
10.0-50.0	7	12.04	57	43	0		14	86	0	4.57	29	57	14
50.1-100.0	20	7.17	80	20	0		30	70	0	4.03	35	55	10
100.1+	5	7.79	60	40	0		20	80	0	2.61	60	40	0

TABLE 14

(CONTINUED)

SCHOOL GROUPING	No. of Schools	LIBRARY			AUDIO-O-VISUAL			TEACHER AIDES (PAID)					
		Mean % TPS Time	Suff. %	More Time %	NA %	Mean % TPS Time	Suff. %	More Time %	NA %	Mean % TPS Time	Suff. %	More Time %	NA %
<u>ELEMENTARY</u>	241	2.78	32	46	22	.16	14	33	53	2.26	17	46	37
TPS													
1.0-7.0	24	1.23	21	21	58	.03	4	4	92	0.24	4	8	88
7.1-14.0	71	2.00	20	49	31	.18	11	25	63	1.66	8	41	51
14.1+	146	3.42	40	48	12	.18	17	41	42	2.88	24	55	21
<u>ELEM-JHS</u>	82	3.13	50	44	6	.20	13	50	37	1.94	13	54	33
TPS													
10.6-20.0	20	3.53	45	45	10	.25	5	40	55	2.18	5	60	35
20.1-30.0	29	3.17	59	35	7	.26	17	62	21	2.04	14	48	38
30.1+	33	2.86	45	52	3	.11	15	46	39	1.71	18	55	27
<u>JHS</u>	44	4.01	64	32	4	.36	23	41	36	0.61	11	41	48
TPS													
15.0	1	3.67	100	0	0	0	0	0	100	0	0	0	100
15.1-30.0	18	5.50	56	39	5	.73	22	28	50	0.22	6	28	66
30.1-45.0	22	2.99	68	32	0	.12	27	50	23	0.81	18	50	32
45.1+	3	2.79	67	0	33	.08	0	67	33	1.70	0	67	33
<u>JHS-SHS</u>	7	3.18	57	43	0	.54	14	71	15	1.80	14	57	29
<u>SHS</u>	32	2.42	41	50	9	.50	22	69	9	0.72	3	44	53
TPS													
10.0-50.0	7	3.92	57	29	14	.50	14	57	29	1.23	0	43	57
50.1-100.0	20	2.00	30	60	10	.31	15	80	5	0.39	0	40	60
100.1+	5	2.02	60	40	0	1.25	60	40	0	1.32	20	60	20

TABLE 14

(CONTINUED)

SCHOOL GROUPING	No. of Schools	TEACHER AIDES (VOLUNTARY)				LABORATORY ASSISTANTS				CLERICAL PERSONNEL			
		Mean % TPS Time	Suff. %	More Time %	NA %	Mean % TPS Time	Suff. %	More Time %	NA %	Mean % TPS Time	Suff. %	More Time %	NA %
<u>ELEMENTARY</u>	241		11	18	71	0.02	1	5	94	7.01	38	51	11
TPS													
1.0-7.0	24	-	8	17	75	0.07	4	0	96	8.70	42	29	29
7.1-14.0	71		10	18	72	0.05	1	10	89	7.78	32	56	11
14.1+	146		12	18	70	0	1	3	96	6.36	40	52	8
<u>ELEM-JHS</u>	82		11	19	60	0.10	4	26	70	5.18	37	50	13
TPS													
10.6-20.0	20	-	5	5	90	0	0	10	90	5.36	65	30	5
20.1-30.0	29		17	17	66	0.06	7	28	65	5.22	38	41	21
30.1+	33		9	30	61	0.19	3	33	64	5.03	18	70	12
<u>JHS</u>	44		2	9	89	0.59	9	34	57	6.65	27	66	7
TPS													
15.0	1	-	0	0	100	0	0	0	100	6.67	0	0	100
15.1-30.0	18		6	0	94	0.25	0	22	78	6.62	28	67	5
30.1-45.0	22		0	18	82	0.94	18	46	36	6.36	32	64	4
45.1+	3		0	0	100	0.35	0	33	67	8.87	0	100	0
<u>JHS-SHS</u>	7		-	14	86	0.45	29	29	42	7.14	43	29	28
<u>SHS</u>	32		3	22	75	0.97	28	47	25	8.24	34	63	3
TPS													
10.0-50.0	7	-	0	0	100	2.13	71	0	29	10.68	57	29	14
50.1-100.0	20		0	30	70	0.55	10	60	30	7.31	25	75	0
100.1+	5		20	20	60	0.98	40	60	0	8.52	40	60	0

ADMINISTRATIVE AND SUPERVISORY STAFF

Administration

Table 14 shows that the mean percentage of total paid staff time spent in administration in the elementary, elementary-junior and junior high grade levels ranged from 5.73 to 6.34 percent. A considerable increase occurred at the junior-senior high grade level and senior high school grade level where the mean percentages of total paid staff time spent in administration were 8.95 and 8.33 percent respectively.

The percentages of total paid staff time allotted to administration were related to the opinions expressed by principals as to the adequacy of these time allotments. In Table 15, about 50 percent of the principals in each of the elementary, elementary-junior high and junior high grade levels felt more time was needed in administration.

TABLE 15
PERCENTAGE DISTRIBUTION OF PRINCIPALS' RESPONSES
ON TIME ALLOTTED TO ADMINISTRATION

Response	Elem.	Elem.- JHS	JHS	JHS- SHS	SHS
Sufficient time	50	48	48	57	72
More time needed	50	52	52	43	28

The responses of junior-senior high and senior high school principals showed that a higher percentage felt that they had sufficient time allotted for administrative tasks.

In the senior high school grade level a larger percentage of the

principals, with total paid staff of between 50.1 and 100.0 members, felt they had sufficient time allotted for administrative tasks than did the principals in either of the other two senior high grade level groups. It was also shown that this middle group had a smaller mean percentage of total paid staff time spent in administration than did either of the remaining two groups.

Supervision

Table 16 shows the principals' responses on time allotted to staff supervision.

TABLE 16
PERCENTAGE DISTRIBUTION OF PRINCIPALS' RESPONSES
ON TIME ALLOTTED TO STAFF SUPERVISION

Response	Elem.	Elem.- JHS	JHS	JHS- SHS	SHS
Sufficient time	30	26	20	29	25
More time needed	70	74	80	71	75

No more than 30% of the principals in any one grade level felt that they had sufficient time allotted for staff supervision.

Ratios for the mean percentage of total paid staff time spent on staff supervision were not developed as comparisons between supervision ratios and the results of the opinionaire were not possible.

The overwhelming majority of principals, in all grade levels, indicated that they did not have sufficient time for staff supervision.

SUPPORT STAFF

The support component in the opinionaire was divided into the following headings: guidance, library, audio-visual, paid teacher aides, voluntary teacher aides, laboratory assistants, and clerical personnel. These categories are discussed individually.

Guidance

Table 17 shows the principals' assessments of the adequacy of time available for guidance personnel.

TABLE 17
PERCENTAGE DISTRIBUTION OF PRINCIPALS' RESPONSES
ON TIME ALLOTTED TO GUIDANCE PERSONNEL

Response	Elem.	Elem.- JHS	JHS	JHS- SHS	SHS
Sufficient time	11	45	41	43	38
More time needed	47	40	57	43	53
Not applicable	42	15	2	14	9

Elementary, junior high and senior high school principals generally felt that more time should be allotted to those individuals responsible for guidance activities. The elementary-junior high school and junior-senior high school principals were divided almost equally in their opinions of adequacy.

When the schools were divided into groups within the grade levels by total paid staff the results generally supported the findings

at the grade level size except in two groups. In the first group, the elementary-junior high school principals who had paid staff members of between 10.6 and 20.0 indicated more strongly than the remaining principals in that grade level that they did not have sufficient time allotted for guidance activities - 15 percent answered "sufficient" as compared with 52 percent and 58 percent.

The second group showing a considerable difference was the senior high schools for over 100.1 paid staff members where the majority of principals indicated that they had sufficient time allotted to their guidance personnel. This was contrary to the opinion expressed by the remaining majority of senior high school principals despite the fact that these latter principals had a higher mean percentage of total paid staff time spent on guidance. However, because only five senior high schools had over 100 total paid staff, differences among this group and other senior high school groups should be cautiously interpreted.

Library

Table 18 shows the principals' assessments of the adequacy of time available for library personnel.

TABLE 18
PERCENTAGE DISTRIBUTION OF PRINCIPALS' RESPONSES
ON TIME ALLOTTED TO LIBRARY PERSONNEL

Response	Elem.	Elem.- JHS	JHS	JHS- SHS	SHS
Sufficient time	32	50	64	57	41
More time needed	46	44	32	43	50
Not applicable	22	6	4	0	9

Elementary and senior high school principals generally felt that more time was required for those individuals responsible for the library. The majority of elementary-junior high, junior high, and senior high school principals said that the library staff had sufficient time for the operation of their libraries.

The opinionnaire results were related to the actual mean percentage of total paid staff time spent on library activities in the various grade levels. The elementary and senior high school grade levels had a lower mean percentage of total paid staff time allotted to the library, being 2.78 and 2.42 respectively, than did the elementary-junior high, junior high, and junior-senior high school grade levels, being 3.13, 4.01, and 3.18 respectively.

When schools were grouped by total paid staff within grade levels, the results generally supported the findings at the grade level size except in two groups. A larger percentage of principals in the elementary grade level with 14.1 or more paid staff members felt they had sufficient time allotted to the library than did the other groups of elementary principals. Schools in this grouping had a larger mean percentage of total paid staff time allotted to the library than did the remaining groups.

The second category where a significant difference occurred was in the senior high school grade level where the majority of principals who had 100.1 or more paid staff members indicated they had sufficient time allotted to the library. This was contrary to the opinion of the remaining principals in the senior high school grade level.

Audio-Visual

Table 19 presents the principals' assessments of the adequacy of time allotted to audio-visual personnel.

TABLE 19
PERCENTAGE DISTRIBUTION OF PRINCIPALS' RESPONSES
ON TIME ALLOTTED TO AUDIO-VISUAL PERSONNEL

Response	Elem.	Elem.- JHS	JHS	JHS- SHS	SHS
Sufficient time	14	13	23	14	22
More time needed	33	50	41	71	69
Not applicable	53	37	36	15	9

In all grade levels, the majority of principals using audio-visual personnel felt that they did not have sufficient time in which to complete their activities. A considerable percentage of schools in the lower grade levels did not have audio-visual personnel as indicated by the high percentages of responses in the "not applicable" category.

The results for schools grouped by total paid staff generally supported the findings of the grade level groupings except in two cases. A slightly larger percentage of junior high school principals with between 30.1 and 45.0 staff members stated they had sufficient time allotted to audio-visual personnel than did the junior high school principals with between 15.1 and 30.0 staff members - 27 percent as compared with 22 percent. This opinion was expressed even though the former group of principals had a much lower mean percentage of total

paid staff time allotted to audio-visual personnel than did the latter group of principals. None of the principals in the three largest junior high schools felt that sufficient time was allotted to audio-visual personnel.

The other exception was the opinion expressed by senior high school principals with more than 100.1 paid staff members. The majority of these principals indicated that they had sufficient time allotted to audio-visual personnel, while the majority of the remaining principals in the other groups stated that more time was needed. However, schools with 100.1 or more paid staff members had a larger mean percentage of total paid staff time allotted to audio-visual personnel (1.25 percent) than did schools in the other two groups (0.50 and 0.31 percent).

Teacher Aides (Paid)

Table 20 shows the principals' assessments of the adequacy of time allotted to paid teacher aides.

TABLE 20
PERCENTAGE OF DISTRIBUTION OF PRINCIPALS' RESPONSES
ON TIME ALLOTTED TO PAID TEACHER AIDES

Response	Elem.	Elem.- JHS	JHS	JHS- SHS	SHS
Sufficient time	17	13	11	14	3
More time needed	46	54	41	57	44
Not applicable	37	33	48	29	53

In all grade levels the majority of principals who were using paid teacher aides indicated that they did not have sufficient time in which to complete the desired activities. As with the audio-visual personnel, it is interesting to note the percentage of schools in each grade level where paid teacher aides were not available. There were, however, contrary to the findings concerning audio-visual personnel, apparently more paid teacher aides working in the lower grade levels than in the higher grade levels. The data on Table 14 (p. 64) show that paid teacher aides tend to form a higher percentage of the total paid staff in the lower grade levels.

The findings of the size groupings within the grade levels supported the findings at the grade level size except in two cases. A higher percentage of elementary school principals with paid staff members of 14.1 or more felt they had sufficient time allotted to paid teacher aides than did the principals in the remaining groups in the elementary grade level. Also, a larger majority of principals in the junior high school grade level with between 30.1 and 45.0 paid staff members felt they had sufficient time allotted to paid teacher aides than did principals in the remaining groups. However, in both cases mentioned in this paragraph, only small percentages (24 and 18 percent) of the principals assessed that the numbers of paid aides were sufficient. Further, increases in the percentages of principals who replied "sufficient time" were not consistently associated with increases in the percentage of total paid staff time occupied by paid aides.

Teacher Aides (Voluntary)

Table 21 presents the principals' assessments of the adequacy of time allotted to voluntary teacher aides.

TABLE 21
PERCENTAGE DISTRIBUTION OF PRINCIPALS' RESPONSES
ON TIME ALLOTTED TO VOLUNTARY TEACHER AIDES

Response	Elem.	Elem.- JHS	JHS	JHS- SHS	SHS
Sufficient time	11	11	2	14	3
More time needed	18	20	9	86	22
Not applicable	71	69	89	0	75

In all grade levels the majority of principals using voluntary teacher aides felt that they did not have sufficient time in which to complete the desired activities. As with the previous two categories the majority of schools did not have the services of voluntary teacher aides available to them.

The findings for size groupings within the grade level generally agreed with the grade level size findings.

Laboratory Assistants

Table 22 presents the principals' assessments of the adequacy of time allotted to laboratory assistants.

TABLE 22

PERCENTAGE DISTRIBUTION OF PRINCIPALS' RESPONSES

ON TIME ALLOTTED TO LABORATORY ASSISTANTS

Response	Elem.	Elem.- JHS	JHS	JHS- SHS	SHS
Sufficient time	1	4	9	29	28
More time needed	5	26	34	29	47
Not applicable	94	70	57	42	25

In all grade levels, except for junior-senior high schools, the majority of principals using laboratory assistants felt that they did not have sufficient time in which to complete desired activities. The large percentage of schools did not have laboratory assistants: however, the appropriateness of use and need for more time were greater for senior high schools than for any other group.

The findings for size groupings within the grade levels agreed with the grade level size findings except in one case. In the senior high school grade level groupings by total paid staff, the principals in each group expressed divergent opinions as to the adequacy of time allotted to laboratory assistants. In the senior high schools of between 10.0 and 50.0 paid staff, 71 percent of the principals indicated that they had sufficient time allotted to laboratory assistants; in senior high schools of between 50.1 and 100.0 paid staff members, 10 percent of the principals felt that laboratory assistants had sufficient time; and in the senior high schools of more than 100.1 paid staff members, 40 percent of the principals felt that laboratory assistants had sufficient time.

Clerical Personnel

Table 23 shows the principals' assessments of the adequacy of time allotted to clerical personnel.

TABLE 23
PERCENTAGE DISTRIBUTION OF PRINCIPALS' RESPONSES
ON TIME ALLOTTED TO CLERICAL PERSONNEL

Response	Elem.	Elem.- JHS	JHS	JHS- SHS	SHS
Sufficient time	38	37	27	43	34
More time needed	51	50	66	29	63
Not applicable	11	13	7	28	3

In all grade levels, excepting junior-senior high schools, the majority of principals using clerical personnel indicated that their clerical personnel required a larger time allotment.

The groupings by total paid staff within the elementary grade level generally agreed with the findings for each elementary school size grouping.

Principals of the various size groupings of the elementary-junior high, junior high and senior high schools showed a wide range of opinion as to whether they had sufficient time allotted to their clerical personnel.

In the elementary-junior high schools of (1) between 10.6 and 20.0, (2) between 20.1 and 30.0, and (3) over 30.1 paid staff members, 65 percent, 38 percent and 18 percent respectively of the principals indicated that they had sufficient time allotted to their clerical

personnel. In the junior high schools of (1) less than 15.1, (2) between 15.1 and 30.0, (3) between 30.1 and 45.0, and (4) over 45.1 paid staff members, 0 percent, 28 percent, 32 percent and 0 percent respectively of the principals indicated that they had sufficient time allotted to their clerical personnel. In the senior high schools of (1) between 10.0 and 50.0, (2) between 50.1 and 100.0, and (3) over 100.1 paid staff members, 57 percent, 25 percent and 40 percent respectively of the principals felt that they had sufficient time allotted to their clerical personnel.

Support Component

The mean percentage of total paid staff time spent in all support positions taken collectively in the elementary, elementary-junior high and junior high grade levels ranged from 13.7 percent to 15.9 percent. The mean percentages of time in the junior-senior high and senior high grade levels were 17.6 percent and 16.8 percent respectively. The junior-senior high and senior high grade levels therefore had slightly higher allotments of time per paid staff member than did the lower grades.

In relating the above mean ratios to the combined results of the opinionaire for the individual categories of the support component, the elementary school and senior high school principals were generally not satisfied with the allotment of time given to the support component.

The majority of elementary-junior high, junior high, and junior-senior high school principals stated that they had sufficient time allotted for at least one category of the support component. A summary of the percentages of principals who stated that sufficient time was available in each support category is presented in Table 24.

TABLE 24

PERCENTAGES OF PRINCIPALS WHO ASSESSED THAT SUFFICIENT TIME
WAS AVAILABLE TO CATEGORIES OF SUPPORT STAFF AFTER
REMOVAL OF NOT APPLICABLE RESPONSES

Category	Sufficient Time				
	ELEM.	ELEM- JHS	JHS	JHS- SHS	SHS
Guidance	19%	53%	42%	50%	41%
Library	41	53	67	57	45
Audio-Visual	30	21	36	17	24
Paid Teacher Aides	27	20	22	20	7
Voluntary Teacher Aides	38	36	20	14	13
Laboratory Assistants	20	13	21	50	38
Clerical Personnel	43	42	28	60	35

The reported increase in allotment of time to the support component between the lower and higher grade levels was not reflected in the results of the opinionnaire. For the support categories of audio-visual personnel, paid teacher aides, voluntary teacher aides and laboratory assistants, the majority of principals, who were using these personnel, felt at all grade levels that these personnel did not have sufficient time to complete desired activities.

A majority of the following principals felt they had adequate time allotted to the remaining support categories of: (1) guidance - elementary-junior high school principals; (2) library - elementary junior high, junior high and junior-senior school principals, and (3) clerical personnel - junior-senior high school principals. The majority of the remaining principals, in the grade level size groupings, indicated that they needed more time allotted to guidance, library and clerical personnel.

SUMMARY OF CHAPTER 5

The results of the opinionnaire were discussed by grade level, and for those size groupings by total paid staff within the grade levels where gross differences occurred. The reasons for this procedure were: (1) the findings in the groupings of schools within grade levels generally supported the findings within their respective grade levels; and (2) the large amount of data available made detailed descriptions of comparisons not feasible.

The junior-senior high and senior high school principals tended to feel that they had sufficient time to complete administrative tasks. The principals of schools in the lower grades were divided, almost

equally, in their opinion on whether they needed more time for administration.

The majority of principals in elementary, elementary-junior high, junior high, junior-senior high and senior high schools felt that they did not have sufficient time allotted in which to complete proper staff supervision activities. No more than 29.5 percent of the principals in any one grade level felt that they had sufficient time for staff supervision.

The majority of principals in the elementary, elementary-junior high, junior high, junior-senior high and senior high grade levels indicated that the amount of time allotted to support personnel generally was insufficient. This opinion was most strongly expressed by the elementary school principals who stated that insufficient time was allotted to all categories (guidance, library, audio-visual, paid aides, voluntary aides, laboratory assistants and clerical personnel) of the support component.

CHAPTER 6

SUMMARY AND CONCLUSIONS

The Problem

This study attempted to describe the relationships between the size of schools and (1) the relative size of in-school administrative and support staff, and (2) the salary cost of in-school administrative and support staff of the four school districts in Edmonton and Calgary. This study also compared in-school administrative and support staff ratios and costs of schools grouped according to size and grade level. The final part of the study dealt with the opinions of the principals as to the adequacy of time allotted to administrative, supervisory and support personnel. These problems were then subdivided into a number of subproblems.

Investigation of the Problem

The population for the study consisted of all schools in the Edmonton and Calgary Public and Separate School Districts. Of the 429 schools approached, 407 or 95.1 percent of the population was analyzed. Data were collected from (1) questionnaires sent to all principals and (2) information from central office files.

The schools were divided into groupings by (1) grade levels and (2) two measures of size, number of pupils and total paid staff within the grade levels. Means for the time and cost of the administrative and support components for each size grouping were calculated. Administrative and support component ratios for time and salary cost, based

on total paid staff and number of pupils were computed. Means of these ratios were also computed for each size grouping.

Pearson product moment correlation coefficients were determined between the following: (1) (a) mean percentage of total paid staff time spent in various functional categories and (b) number of total paid staff; and (2) (a) number of paid staff members per 1000 pupils in various functional categories and (b) total number of pupils.

From the opinionaire part of the questionnaire sent to principals, frequency and percentage frequency distributions of responses were developed. The results, where possible, were related to the mean percentage time of total paid staff time spent in a particular position. This was done for all grade level size groupings and for those groupings, by total paid staff, where gross differences occurred.

Findings of the Study

1. Relationship between administrative proportion and size of school. The elementary, junior high and senior high school grade levels were found to have negative correlation coefficients significant at the .05 level, between (1) the number of administrative personnel per 1000 pupils and number of pupils, and (2) between the percentage of total paid staff in administration and the number of total paid staff. That is, for those grade levels, the administrative time ratios decreased as the school size increased, both in terms of number of pupils and total paid staff. The elementary-junior high, junior-senior high school grade levels and groupings within grade levels by number of pupils and total paid staff, in the majority of cases, did not have significant correlation coefficients for these variables at the .05 level.

2. Relationship between proportional administrative salary cost and size of school. The correlation coefficients between (1) the cost per pupil of administrative personnel and number of pupils, and (2) between the cost per paid staff member of administrative personnel and total paid staff, in the elementary, junior high and senior high school grade levels, were also negatively and significantly ($p < 0.01$) correlated. This indicates an inverse relationship for those grade levels between the administrative salary cost and size of schools.

3. Relationship between support proportion and size of school. The number of support personnel per 1000 pupils correlated negatively and significantly ($p < 0.01$) with the number of pupils at the elementary and senior high school grade level. The correlation coefficient between the percentage of total paid staff time spent on support positions and total paid staff was found to be negative and significant ($p < 0.05$) at the senior high school grade level. When using both measures of size, number of pupils and total paid staff, only the senior high school grade level showed decreasing support time ratios as size increased.

4. Relationship between proportional support salary cost and size of school. The correlation coefficients between the cost per pupil of support personnel and number of pupils were found to be negative and significant ($p < 0.05$) in the elementary-junior high, junior high and senior high school grade levels. Correlation coefficients between cost per paid staff member of support personnel and total paid staff were negative and significant ($p < 0.05$) at the junior and senior high school

grade levels, while the elementary grade level had a positive and significant ($p < 0.05$) correlation coefficient. The junior high and senior high school grade levels showed a consistent inverse relationship between (1) support cost and (2) both the number of pupils, and total paid staff.

5. Relationship between non-instructional proportion and size of school. The number of non-instructional personnel per 1000 pupils correlated negatively and significantly ($p < 0.05$) with the number of pupils at the elementary, junior high and senior high school grade levels. The correlation coefficients between the percentage of total paid staff time spent on non-instructional positions and total paid staff were found to be negative and significant ($p < 0.05$) at the junior high and senior high school grade level.

6. Relationship between proportional non-instructional salary cost and size of school. The cost per pupil of total non-instructional staff correlated negatively and significantly ($p < 0.05$) with the number of pupils for elementary, elementary-junior high, junior high and senior high schools. The correlation coefficients between cost per paid staff member of total non-instructional staff and total paid staff were negative and significant ($p < 0.01$) for the junior high and senior high schools.

7. Assessments of the adequacy of time allotted to non-instructional functions. The results of the opinionaire to principals on the adequacy of the time allotted to various administrative and support positions indicated the following: (1) the majority of

junior-senior high and senior high school principals felt that they had sufficient time to complete administrative tasks; (2) the majority of principals in all grade levels felt they did not have enough time for staff supervision; and (3) the amount of time allotted to the support component generally was insufficient, with particular deficiencies in time for guidance in the elementary schools and aides of varying types in schools of all grade levels.

Implications of the Findings

The study showed that larger schools in the elementary, junior high and senior high school grade levels tended to have lower administrative personnel and salary ratios. Staffing officers may feel that there are advantages of scale in the administrative area in terms of time and salaries.

Only at the senior high school grade level did the larger schools, in terms of both number of pupils and total paid staff, have smaller support ratios. This may imply that the same advantages of scale cannot be gained with the support component as with the administrative component.

The results of the opinionaire to principals revealed a general dissatisfaction with the time allotments for all non-instructional positions. The possibility of increasing employment of aides, perhaps associated with differentiated staffing, and greater use of guidance personnel in the lower grades, appear to warrant examination.

Recommendations for Further Study

A similar longitudinal study of a particular district might

prove useful in that it would provide a pattern over a number of years with less possibility of being affected by an oddity (for example, financial differences, differences in staffing location, etc.) in any year picked for purposes of a cross-sectional study.

Investigation of the administrative, support and non-instructional components, comparing rural and urban districts in Alberta would be of interest. This could point out results of effects of the new foundation program.

This present study included an opinionnaire which requested a response from the principals as to their feelings regarding the allotment of time to administrative and support positions. This opinionnaire should be advanced further in an attempt to find out the reasons for the various responses.

In the larger context, this study should be viewed as having provided information on only one aspect of school staffing practices. Studies which research other aspects related to optimal size of schools are needed. Specifically, measures of productivity, and levels of staff and student cohesion, participation and satisfaction could be examined for schools of different size.

An in-depth study which examines the actual functions of in-school administrators, who have designated allotments of time to be spent in administrative activities, would be of considerable value.

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APPENDIX

INSTRUMENTS USED FOR COLLECTING DATA



January 15, 1971

STUDY OF IN-SCHOOL STAFFING RATIOS

School _____

System (Circle one) EPSD ESSD CPSD CSSD

QUESTIONNAIRE FOR PRINCIPALS

The major purposes of this study are:

1. To examine the relationship between school size and the proportion of in-school staff engaged in various activities such as administration, staff supervision and guidance;
2. To compare these relationships with principals' perceptions of the adequacy of time allotted to staff for these activities.

Please answer every item, or mark N/A for Not Applicable. All information relating to individuals will be confidential, and the report, to be sent to each principal, will contain compilations for groups of schools.

Your co-operation is very much appreciated.

1. UTILIZATION OF TIME BY ADMINISTRATIVE AND SUPERVISORY STAFF

Total of %'s should be 100% for each individual.
Average this time over the two semesters in 1970-71.

Administrative or Supervisory Position	Names	Average % of time spent each week on		
		Administration and staff supervision	Teaching	Preparation
e.g. Vice-principal	John Doe	50%	40%	10%
	Mary Brown	40%	50%	10%
Principal				
Vice-Principal				
Business Manager				
Department head, co-ordinator or consultant, or assistant to these positions				
Other - specify				
1				
2				
3				

2. TOTAL % OF TIME ALLOTTED TO CONSULTANTS AND COORDINATORS
ATTACHED TO YOUR STAFF TO VISIT TEACHERS IN OTHER SCHOOLS.

Field Coordinator or consultant attached to your school	% time allotted to <u>your school</u> per week for <u>consultation</u>	% time allotted to <u>other schools</u> per week for <u>consultation</u>
<u>Names</u> e.g. Michael Ward	15%	30%
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Check here if you do not have any such staff. _____

3. UTILIZATION OF TIME BY SUPPORT STAFF OF YOUR SCHOOL

Total of %'s should be 100% for each individual.
Average this time over the two semesters in 1970-71.

A. Support position	Names	Check (✓) here if also teaching	Average % of time <u>spent</u> each week on		
			This position	Teaching	Preparation
e.g. Library	Mary Smith	✓	50%	20%	30%
Guidance personnel					
Library personnel					
Audio-visual personnel					

B. Support position	Number of persons in each position in full-time equivalents e.g., 2.5	Total number of persons in each position e.g., 4
Paid teacher aides		
Voluntary teacher aides		
Laboratory assistants		
Office staff (stenographers, secretaries, clerical)		
Other - specify		
1.		
2.		
3.		

4. WHAT IS YOUR OPINION CONCERNING THE AMOUNT OF TIME ALLOTTED TO ADMINISTRATIVE AND SUPERVISORY STAFF (i.e., PRINCIPALS, VICE-PRINCIPALS, BUSINESS MANAGERS, DEPT. HEADS, COORDINATOR OR CONSULTANT) FOR IN-SCHOOL ADMINISTRATION AND SUPERVISION OF STAFF?

PLACE ONE ✓ IN EACH COLUMN

	Time available for <u>administration</u>	Time available for assistance with <u>staff supervision</u>
1. Sufficient time		
2. More time needed		

Comment, if you wish to, upon reasons for your response.

5. WHAT IS YOUR OPINION CONCERNING THE AMOUNT OF TIME ALLOTTED
 FOR IN-SCHOOL SUPPORT PERSONNEL?
 PLEASE PLACE ONE ✓ IN EACH COLUMN

	Guidance personnel	Library personnel	Audio-visual personnel	Teacher aides		Laboratory assistants	Clerical personnel
				<u>Paid</u>	<u>Voluntary</u>		
1. Sufficient time							
2. More time needed							
Not Applicable							

Comment, if you wish to, upon reasons for your response.

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